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1944

TM 11-246A

U.S. WAR DEPARTMENT TECHNICAL MANUAL

U.S. Dept of Army

RADIO SET

SCR-503-A



WAR DEPARTMENT • 30 MARCH 1944

THE OLD MAN
A-810-808

THE OLD MAN

A-810-808

RADIO SET

SCR-503-A



WAR DEPARTMENT • 30 MARCH 1944

WAR DEPARTMENT,
WASHINGTON 25, D. C. 30 MARCH 1944.

TM 11-246A, War Department Technical Manual, Radio Set SCR-503-A, is published for the information and guidance of all concerned.

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BY ORDER OF THE SECRETARY OF WAR:

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(For explanation of symbols see FM 21-6.)

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SAFETY NOTICE

Voltages present in this equipment are dangerous to human life. If they are contacted, severe shock or injury will result. Observe safety rules when working on this equipment. Always disconnect the power cord before removing the receiver chassis from its cabinet.

DESTRUCTION NOTICE

WHY—To prevent the enemy from using or salvaging this equipment for his benefit.

WHEN—Ordered by your commander.

HOW—1. Smash—Use sledges, axes, handaxes, pick-axes, hammers, crowbars or heavy tools.

2. Cut—Use axes, handaxes or machetes.

3. Burn—Use gasoline, kerosene, oil, flame throwers, or incendiary grenades.

4. Explosives—Use fire arms, grenades or TNT.

5. Disposal—Bury in slit trenches, fox-holes, other holes. Throw in streams. Scatter.

USE ANYTHING IMMEDIATELY AVAILABLE FOR DESTRUCTION OF THIS EQUIPMENT.

WHAT—1. Smash—Compass, meter, dial, tuning controls, loop, battery dynamotor, switches, tubes, sockets, microphone, headset, tuning capacitors, resistors, coils, jacks, plugs, sense antenna, tripods, azimuth scales, loop appendage, and cabinets.

2. Cut—Microphone and headset cords, battery cable and all interior wiring.

3. Burn—Covers, cords, cables, chests, capacitors, resistors, coils, wiring diagrams, and manuals.

4. Bury or Scatter—Any or all of the above pieces after destroying them.

DESTROY EVERYTHING

SECTION I

DESCRIPTION

1. GENERAL.

a. Radio Set SCR-503-A consists of two portable direction finders, each an independent operating unit and each differing from the other in frequency range. One unit covers the range of 1 to 3 megacycles (mc) in 2 bands; the other covers the range of 100 to 1,000 kilocycles (kc) in 3 bands.

b. Each direction finder uses two loops, permanently placed at an angle of 90° with respect to each other and mounted on a common vertical axis (fig. 6). This pair of loops, called the loop assembly, rotates about a common vertical axis. On it is mounted the telescoping sense antenna. The signal is picked up by each loop and by the antenna (when used for sensing), and is fed through a pair of shielded conductors to separate collector rings, which rotate with the loop assembly. It is then fed through stationary brushes into the receiver.

c. Each receiver is a specially designed twin-channel superheterodyne for amplitude-modulated (a-m) or c-w signals, and operates from a dynamotor power supply. Each channel amplifies the signal received by its respective loop. The separate amplified outputs are connected to individual movements of the DIRECTION INDICATOR, the pointers of which move and intersect over a common dial.

d. Direction is ordinarily obtained by rotating the loops to the position at which the pointers cross on the orange-colored 0° line (mid-scale) of the DIRECTION INDICATOR, and then noting the angle on the azimuth scale.

e. In addition, the DIRECTION INDICATOR dial is calibrated in 10° lines to the left and right of zero, so that the position of the pointer intersection indicates the angle. Thus, a continuous indication of the angle (up to plus or minus 45° relative to a given heading) is observed without requiring rotation of the loop.

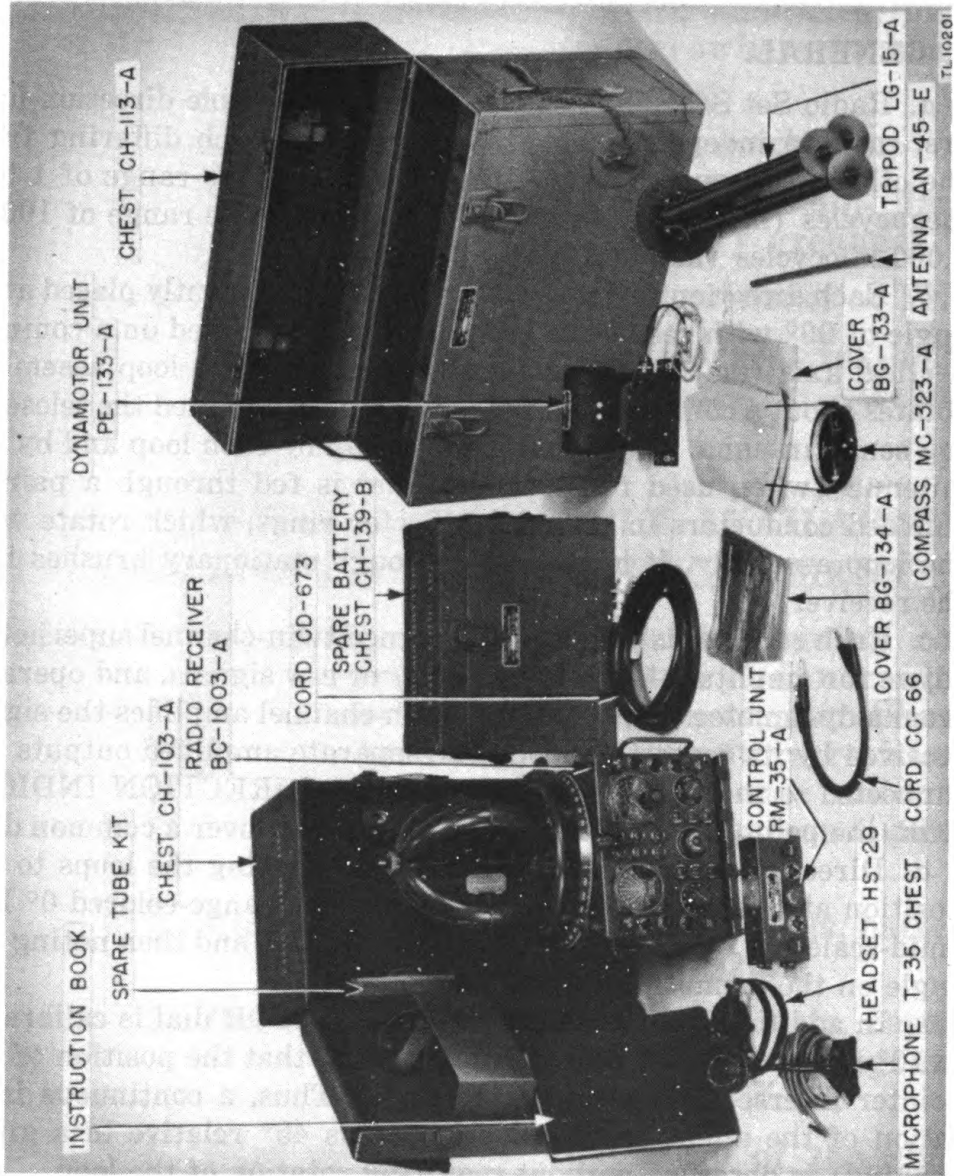


Figure 1. Radio Set SCR-503-A, main components, less Radio Receiver BC-973-A

2. MAIN COMPONENTS.

a. *Radio Receiver BC-973-A (2-band set).* Radio Receiver BC-973-A covers the range from 1-3 mc in two bands: band A, 1-2 mc; band B, 2-3 mc. The receiver uses 11 tubes in its twin channel circuit, each channel having two stages of i-f amplification, as shown in figure 2.

b. *Radio Receiver BC-1003-A (3-band set).* The other receiver, Radio Receiver BC-1003-A, covers the frequencies in the following three bands: Band A, 100-200 kc; band B, 200-450 kc; band C, 450-1,000 kc. This receiver has three stages of i-f amplification in each channel, and therefore uses two extra tubes making 13 in all, as shown in figure 3.

c. *Power supply (fig. 33).* Dynamotor unit PE-133-A is used for the plate supply for either receiver. Each receiver requires 230 volts at 90 milliamperes. The dynamotor is operated from a 12 volt storage battery which also supplies the filament power to the receiver tubes.

d. *Control Unit RM-35-A (fig. 32).* Provision is made in Control Unit RM-35-A for switching the output of the set to a telephone line when the OUTPUT jack of the receiver is connected to the control unit by a patching cord. Switching is also provided in the control unit for connecting the operator's headset to a telephone line for communication with a remote station and to the radio set at the same time, or to either alone. The operator's microphone may be connected to the telephone line only.

3. INDIVIDUAL COMPONENTS (fig. 1).

(For descriptions, see ref. Nos. 301-315 on the table of replaceable parts).

Quantity	Article	Dimensions (in.)	Weight (lb.)
2	Antenna AN-45-E	16½ (collapsed) 97 (extended)	0.6
2	Azimuth Scale M-333-A	10 ⁵ / ₁₆ (diam.)	2.7
4	Battery, storage, 12-volt, 63 ampere hours, Exide 6xT13 or equal (2 in use, 2 spare)	13 ⁷ / ₈ x 7 ³ / ₁₆ x 10 ³ / ₄	67.5
2	Chest CH-103-A	14 ³ / ₄ x 16 x 22	23.3
2	Chest CH-113-A	27 ¹ / ₂ x 9 x 22	31.3
2	Chest CH-139-B	15 ³ / ₄ x 8 ¹ / ₂ x 12 ¹ / ₂	14.0
2	Compass MC-323-A	4 ³ / ₁₆ (diam.)	1.3
2	Control Unit RM-35-A	7 ¹ / ₄ x 2 ⁵ / ₈ x 2 ³ / ₄	3.0
4	Cord CC-66	18 ³ / ₈ x 5 ⁵ / ₁₆ (diam.)	2.8
2	Cord CD-673	120 x 5 ⁵ / ₈ (diam.)	3.3
2	Cover BG-133-A		0.4
2	Cover BG-134-A		0.1
2	Dynamotor Unit PE-133-A with 2 spare high-voltage and 2 spare low-voltage brush assemblies and 2 spare fuses	5 ¹ / ₁₆ x 4 ¹ / ₁₆ (base), 7 ¹ / ₈ (height)	8.1
2*	Headset HS-29-E		0.7
1	Lqop Assembly LP-23-A	11 ¹ / ₂ (height), 10 ¹ / ₄ (diam.)	4.3
1	Loop Assembly LP-33-A	11 ¹ / ₂ (height), 10 ¹ / ₄ (diam.)	4.7
2	Technical Manual for Radio Set SCR-503-A	5 ⁷ / ₈ x 9	
2*	Microphone T-35 (chest)		1.5
2	Plate FT-363-A	13 x 11 ¹ / ₆ x 1 ⁵ / ₁₆	1.8
1	Radio Receiver BC-1003-A with 2 spare pilot lamps	13 x 11 ¹ / ₁₆ x 11 (height without loop) 20 ¹ / ₂ (height with loop)	27.0
1	Radio Receiver BC-973-A with 2 spare pilot lamps	13 x 11 ¹ / ₁₆ x 11 (height without loop) 20 ¹ / ₂ (height with loop)	26.5
2	Tripod LG-15-A	5 ¹ / ₂ (diam.) (top disk) 22 ¹ / ₂ (legs collapsed) 40 ¹ / ₂ (legs extended)	5.5

*Not supplied by manufacturer.

Quantity	Article	Dimensions (in.)	Weight (lb.)
11	Tubes, vacuum, installed in Radio Receiver BC-973-A, as follows: 1 VT-134 2 VT-153 2 VT-161 2 VT-162 4 VT-209		Included in Radio Receiver BC-973-A
12	Tubes, vacuum, spare for BC-973-A, as follows: 2 VT-134 2 VT-153 2 VT-161 2 VT-162 4 VT-209		1.2
13	Tubes, vacuum, installed in BC-1003-A, as follows: 1 VT-134 2 VT-153 2 VT-161 2 VT-162 6 VT-209		Included in BC-1003-A
14	Tubes, vacuum, spare for BC-1003-A, as follows: 2 VT-134 2 VT-153 2 VT-161 2 VT-162 6 VT-209		1.4

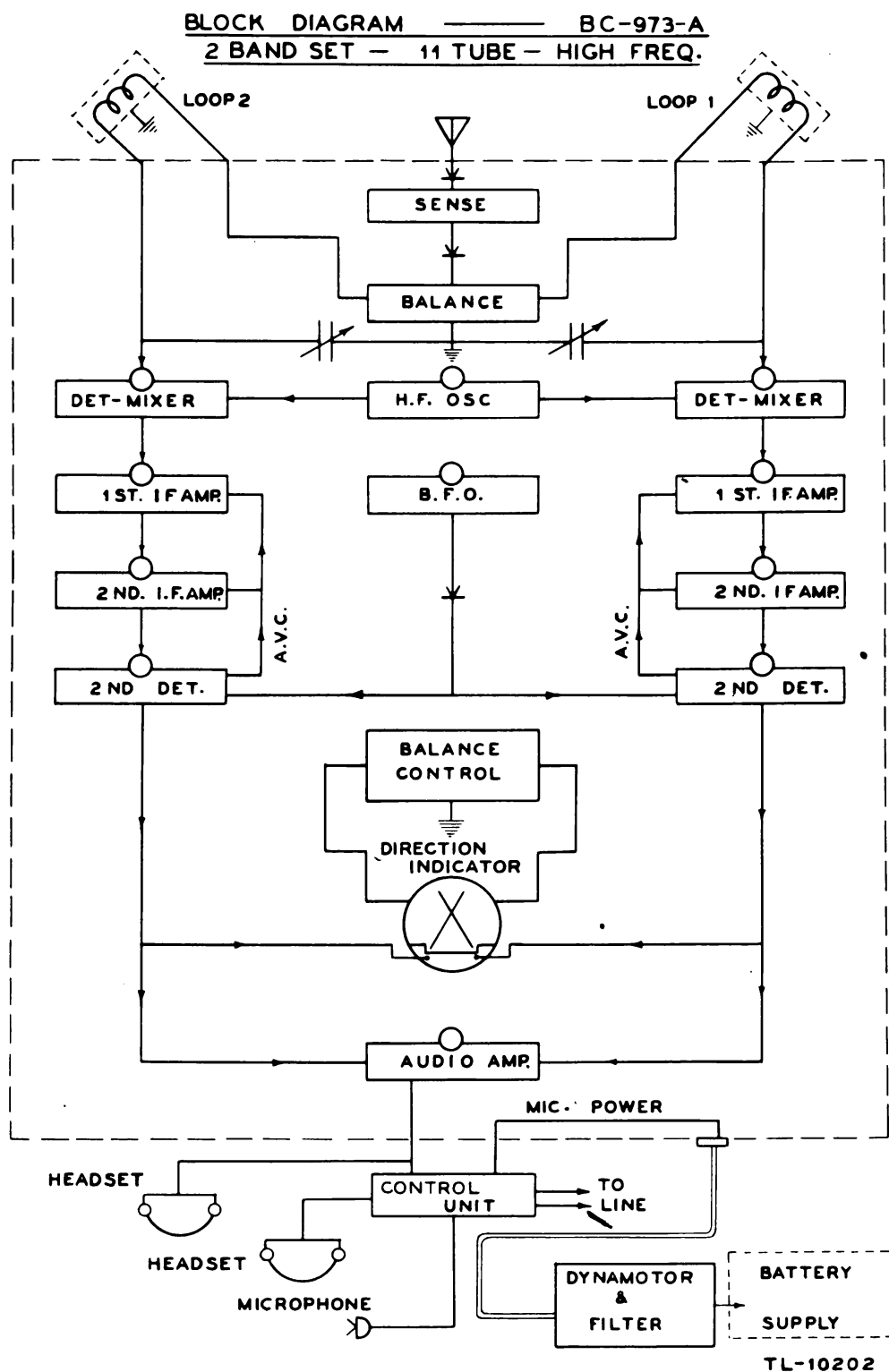
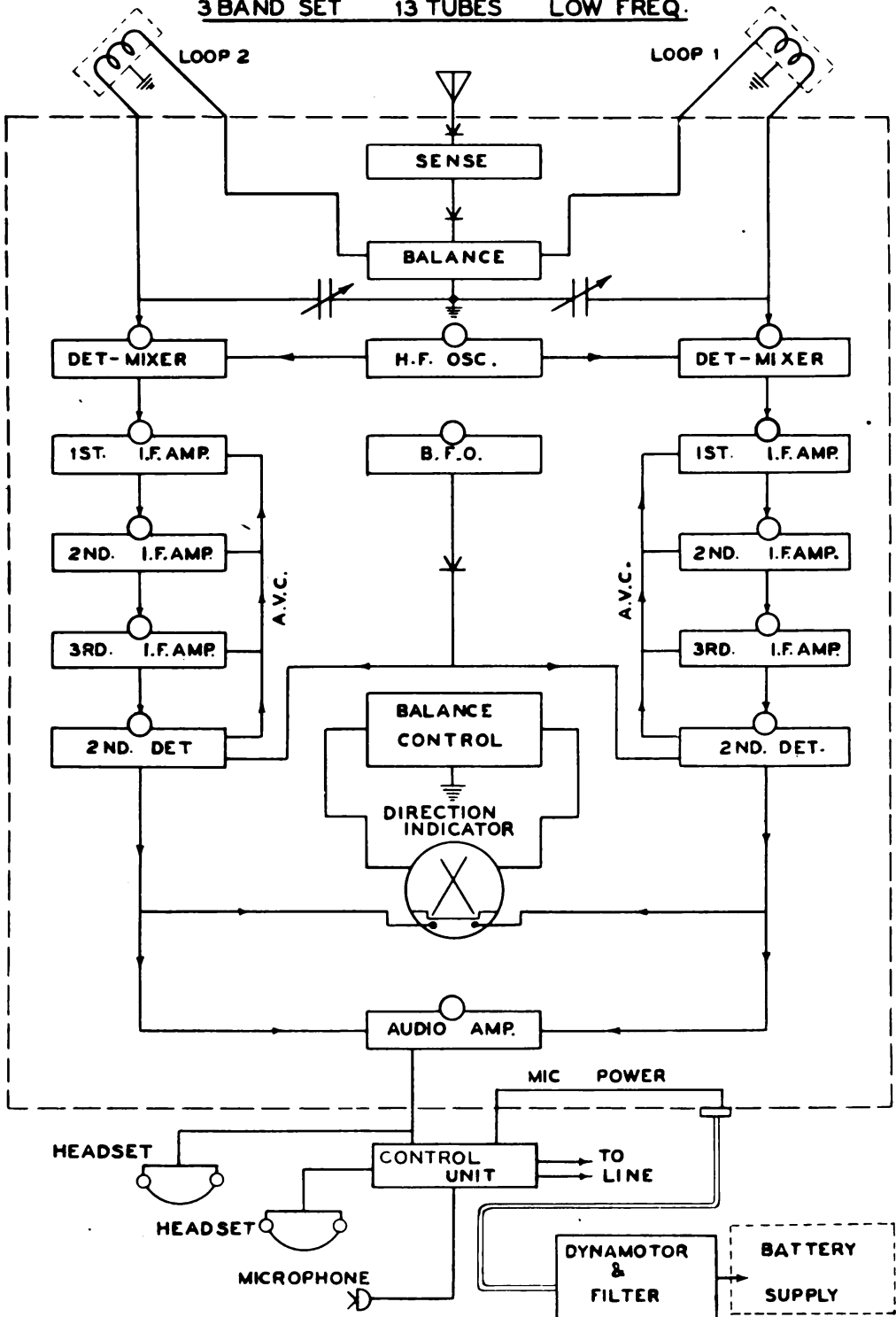


Figure 2. Radio Receiver BC-973-A, block diagram.

BLOCK DIAGRAM **BC 1003-A**
3 BAND SET 13 TUBES LOW FREQ.



TL-10203

Figure 3. Radio Receiver BC-1003-A, block diagram.

SECTION II

INSTALLATION AND OPERATION

4. PRECAUTIONARY MEASURES.

a. This radio direction finder differs from ordinary radio equipment in that it contains two carefully adjusted and balanced receiving channels. These adjustments are factory made and are accessible on the front panel. Any disturbance will affect proper operation. Therefore, do not tamper with them. Accessibility is provided only for the purpose of readjustment in case of damage or other unusual circumstances. Use of these controls for adjustment is explained in detail in paragraph 26.

b. It is important to watch the points listed below in order to avoid faulty operation or damage to the equipment.

(1) Be sure the ON-OFF switch on the lower right hand side of the front of the receiver panel is in the OFF position when any cables are being connected.

(2) Check the level of electrolyte in the batteries and add water if the plates are not covered. Be sure they are sufficiently charged.

(3) Check all cable connections to make certain they are tight.

5. INSTALLATION. (Refer to figures 4, 5, 6, and 7.)

a. Remove Tripod LG-15-A from top of battery Chest CH-113-A.

b. Set up the tripod and adjust the legs to the desired height. The lower part of each leg locks in place when the disk on the bottom of the leg is turned clockwise.

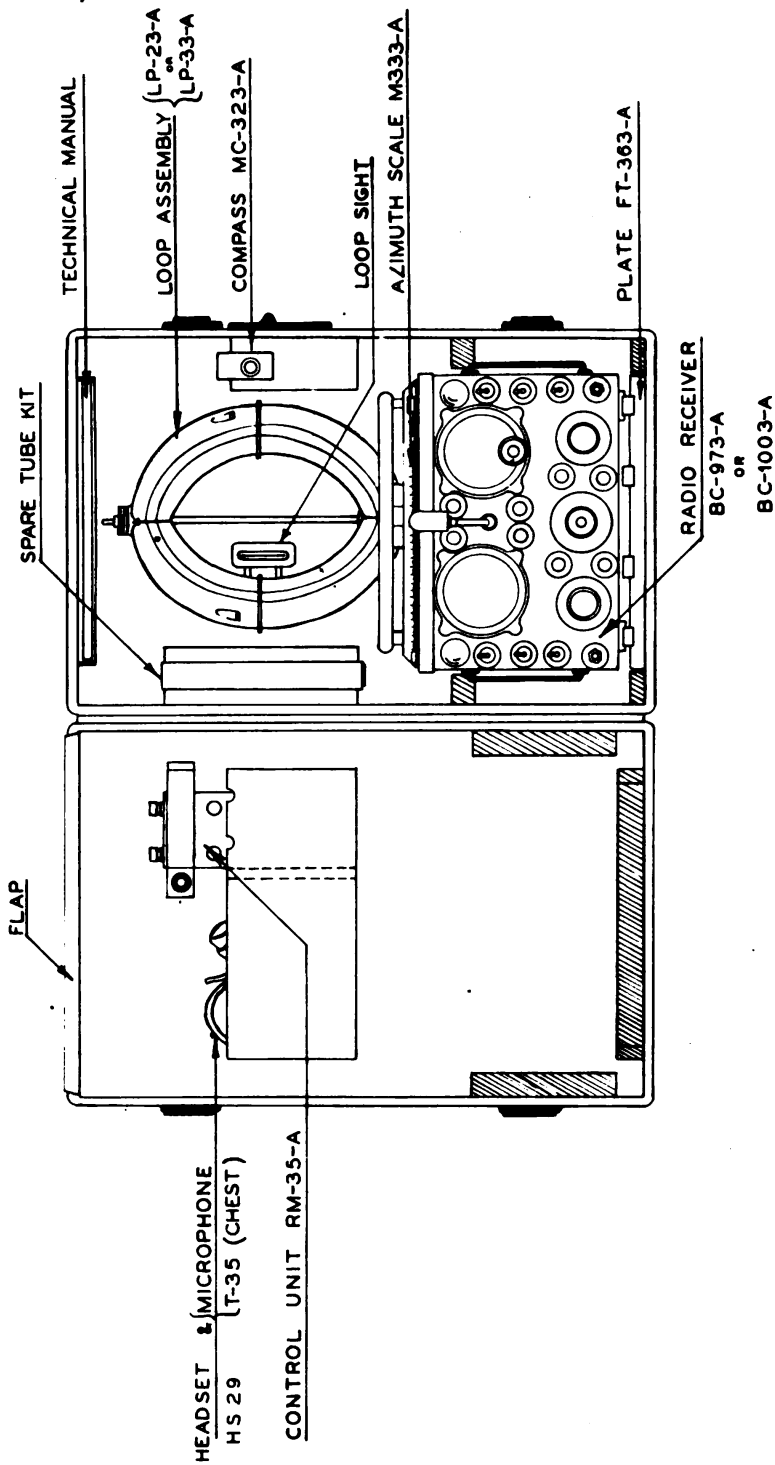
c. Remove Compass MC-323-A from Chest CH-103-A.

d. Mount the compass on the tripod and fasten by tightening the screw handle of the tripod. When tightening, allow some slack so that the compass may be rotated to line up the sights with a target.

e. Adjust the tripod legs until the spirit levels in the compass indicate that the compass is level and release the knurled screw on the bottom of the compass until the needle swings freely.

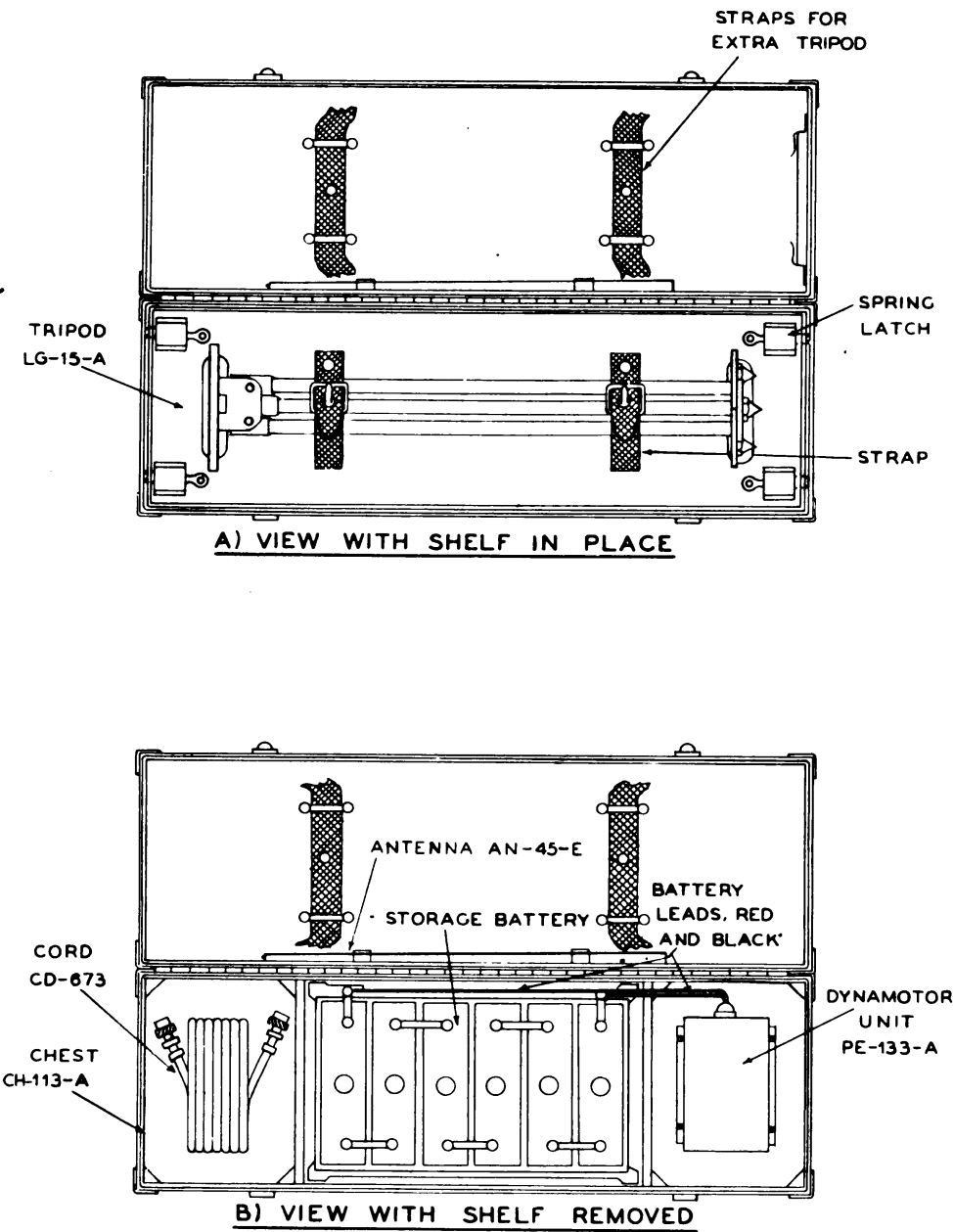
f. Check the position of the 0 mark on the compass scale with respect to the reference line under the front sight. For direct reading from *magnetic north*, the 0 mark on the scale must coincide with the reference line. The scale can be rotated by means of the small stud on top of the compass. When the 0 mark coincides with the reference line, the angle from *magnetic north* of any object sighted will be indicated directly on the scale reading from the end of the needle marked with an arrow.

g. To calibrate the compass for direct reading from *true north*, rotate the compass scale to the east or west by the amount of the



TL10204

Figure 4. Receiver Chest CH-103-A, packed for transportation.



TL 10205

Figure 5. Battery Chest CH-113-A, packed for transportation.

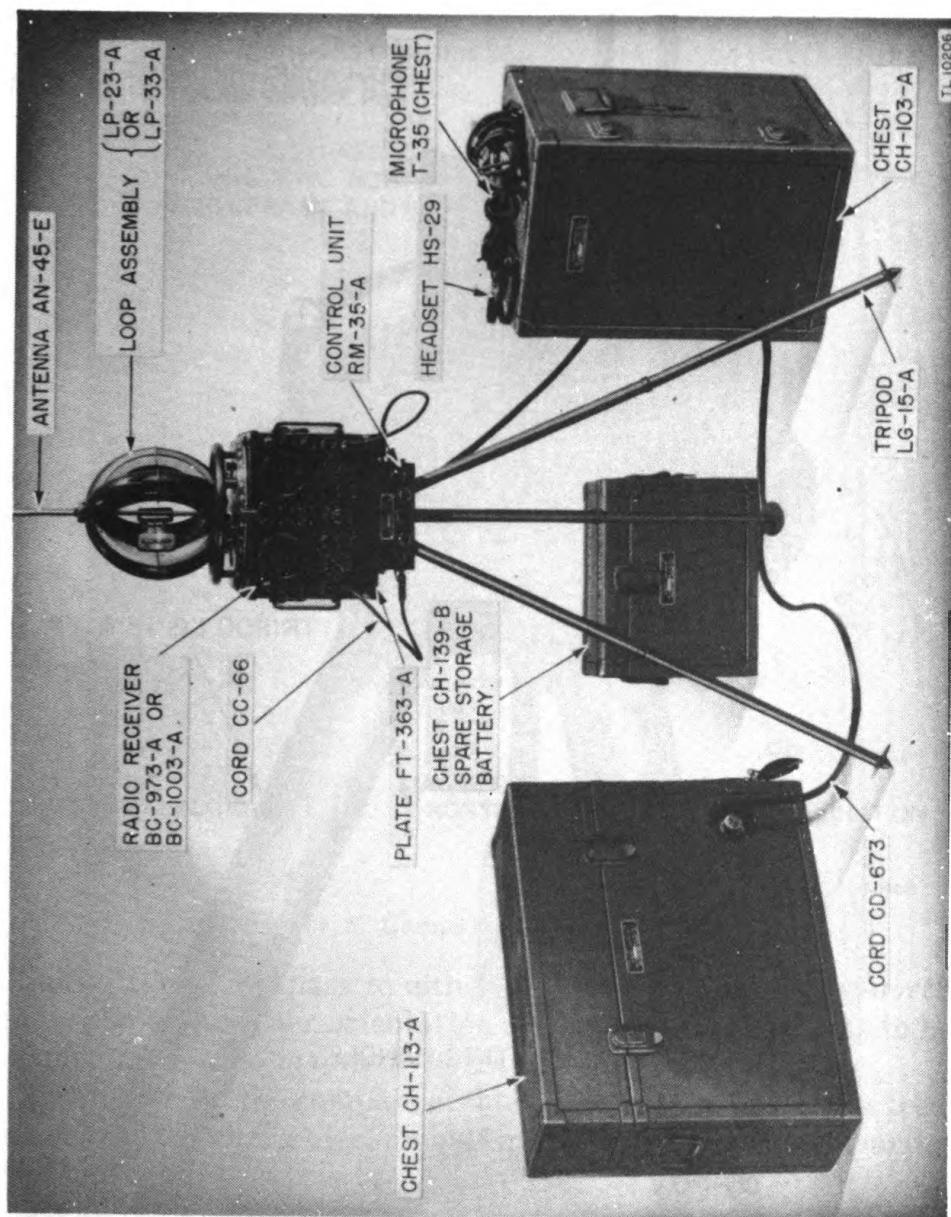


Figure 6. Radio Set SCR-503-A, set up for operation.

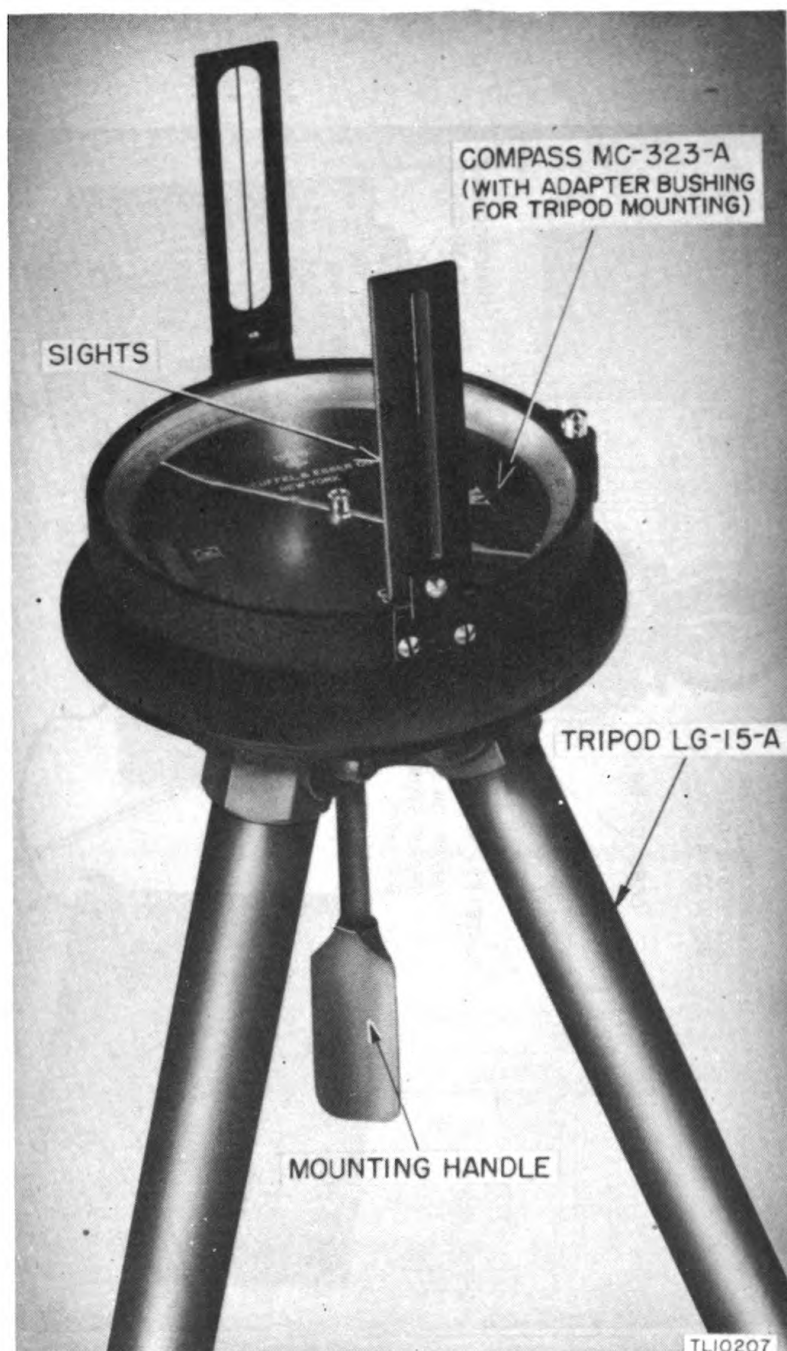
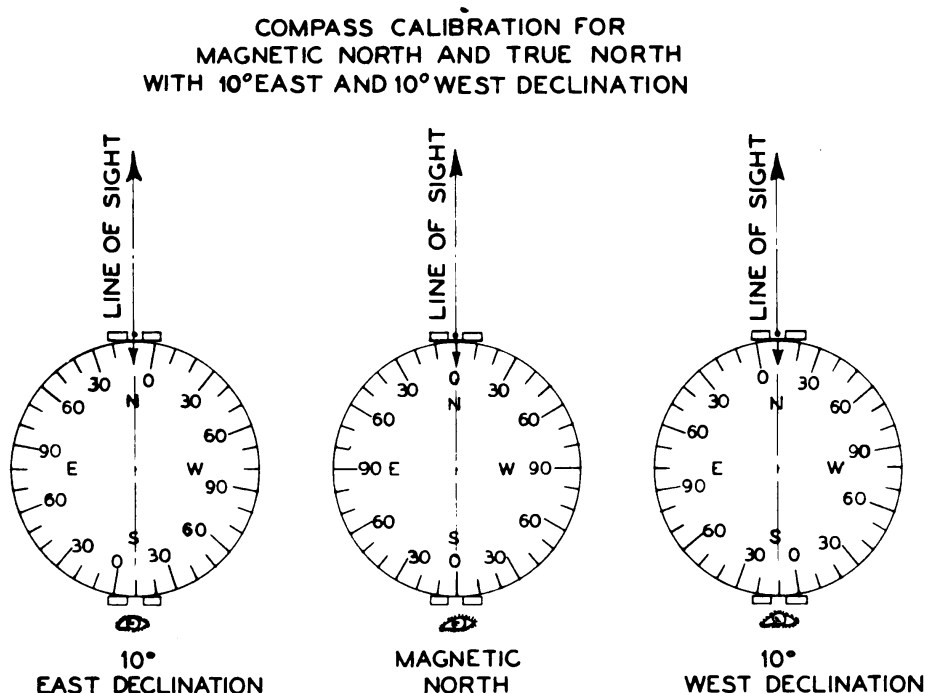


Figure 7. Compass MC-323-A, mounted on tripod.

magnetic declination of the particular locality. That is, if the declination is 10° west, the compass scale must be rotated until the 10° graduation on the W side of the compass coincides with the index or reference line. If the declination is 10° east, the compass scale must be rotated until the 10° graduation on the E side of the compass coincides with the reference line.

h. Examples of compass calibration for *magnetic north* and *true north* are shown in figure 8.



TL 10208

Figure 8. Compass calibration.

i. Calibrate the compass to either *magnetic north* or *true north* depending upon whether orientation of the direction finder is to be made with respect to *magnetic north* or *true north*.

j. Sight through the compass sights on any object such as a tree, tower, or pole which is at least a half mile away. Record the bearing of the object.

k. Tighten the knurled screw on the bottom of the compass until the needle is up against the glass and remove the compass from the tripod.

l. Remove the receiver from Chest CH-103-A and mount it on the tripod. Rotate the receiver to any desirable operating position, and fasten it in place by tightening the screw handle of the tripod.

m. Remove telescopic Antenna AN-45-E from inside the cover of battery Chest CH-113-A. Attach it to the mounting screw on top of the loop assembly and extend it to its full height.

n. Remove Cord CD-673 from the left side of Chest CH-113-A and plug either end into Receptacle SO-69, at the back of the receiver. Do this by lining up the arrows on the plug and receptacle before pushing the plug in, and then screwing in the loose fitting knurled collar on the plug.

o. Plug the other end of the cord into Receptacle SO-69 on the dynamotor unit, through the hand hole in the front of the battery chest.

p. Make sure that the two individual red and black battery leads (216-1 and 216-2), which end in spade lugs, are correctly connected to the storage battery; the red lead going to the plus (+) terminal of the battery, and the black lead to the minus (-) terminal. Turn the screw terminals of the battery clockwise until they securely clamp the spade lugs. The two prong plug (212), at the other end of the battery leads, fits into the back of the dynamotor. Push the plug into place and lock with a clockwise twist. The dynamotor unit rests on a board which is held down by a leaf spring at the rear of the chest. Press the spring backward and lift to remove the unit, if necessary.

q. Remove Control Unit RM-35-A from receiver Chest CH-103-A, and attach to the bottom of receiver mounting Plate FT-363-A, by means of the two central slide fasteners. Operate these fasteners by first pulling them forward to open, and then, after inserting the unit, pushing them back to lock the unit in place.

r. Check all connecting cables for firm connections to insure satisfactory set-up for operation.

NOTE: Use of the control unit with a telephone line is given in paragraph 6b.

s. Turn the BRAKE control on the top of the set to the OFF position.

t. Release the knob marked LOOP LOCK by lifting it until the guide pin is clear of its hole and then turn the knob in either direction (fig. 10).

u. Rotate the loop assembly until the object previously sighted upon with the compass is in line with the loop sights.

v. Loosen the knob marked SCALE LOCK by unscrewing it about one half turn. AZIMUTH SCALE M-333-A can then be rotated with respect to the loop assembly.

w. Keeping the object in the loop sights, rotate the azimuth scale until the angle indicated on the white scale by the white index line on the front of the receiver cover is the same as the compass reading. For example, if the bearing of the object indicated by the compass is north 15° east, then the angle indicated on the white scale on the receiver shall also be 15° (example A in fig. 9). If the compass bearing is north 15° west, then the reading on the white scale shall be 345° (example B in fig. 9).

x. When the azimuth scale has been set properly with the object still in line with the loop sights, tighten the SCALE LOCK knob.

y. The direction finder is now oriented so that azimuths taken on signals will be indicated in degrees from north (magnetic or true, depending on how the compass has been calibrated).

NOTE: An azimuth is a horizontal angle measured in a clockwise direction from the north point of a reference line (usually a north-south line) to a line connecting the instrument and the transmitter

6. NORMAL OPERATION.

a. Operating steps. (1) First, check the position of the switches on the front panel (fig. 11 and 12) :

Left-Side Controls	Right-side controls
METER DAMP-OFF switch to OFF	LIGHTS—OFF Switch-as desired
SENSE switch—not pressed	MVC — AVC switch to MVC
CW OSC.—OFF switch to OFF	ON—OFF switch to OFF
OUTPUT jack — phones plugged in	

(2) Throw the ON-OFF switch to ON to start the dynamotor, and allow the tubes to heat up.

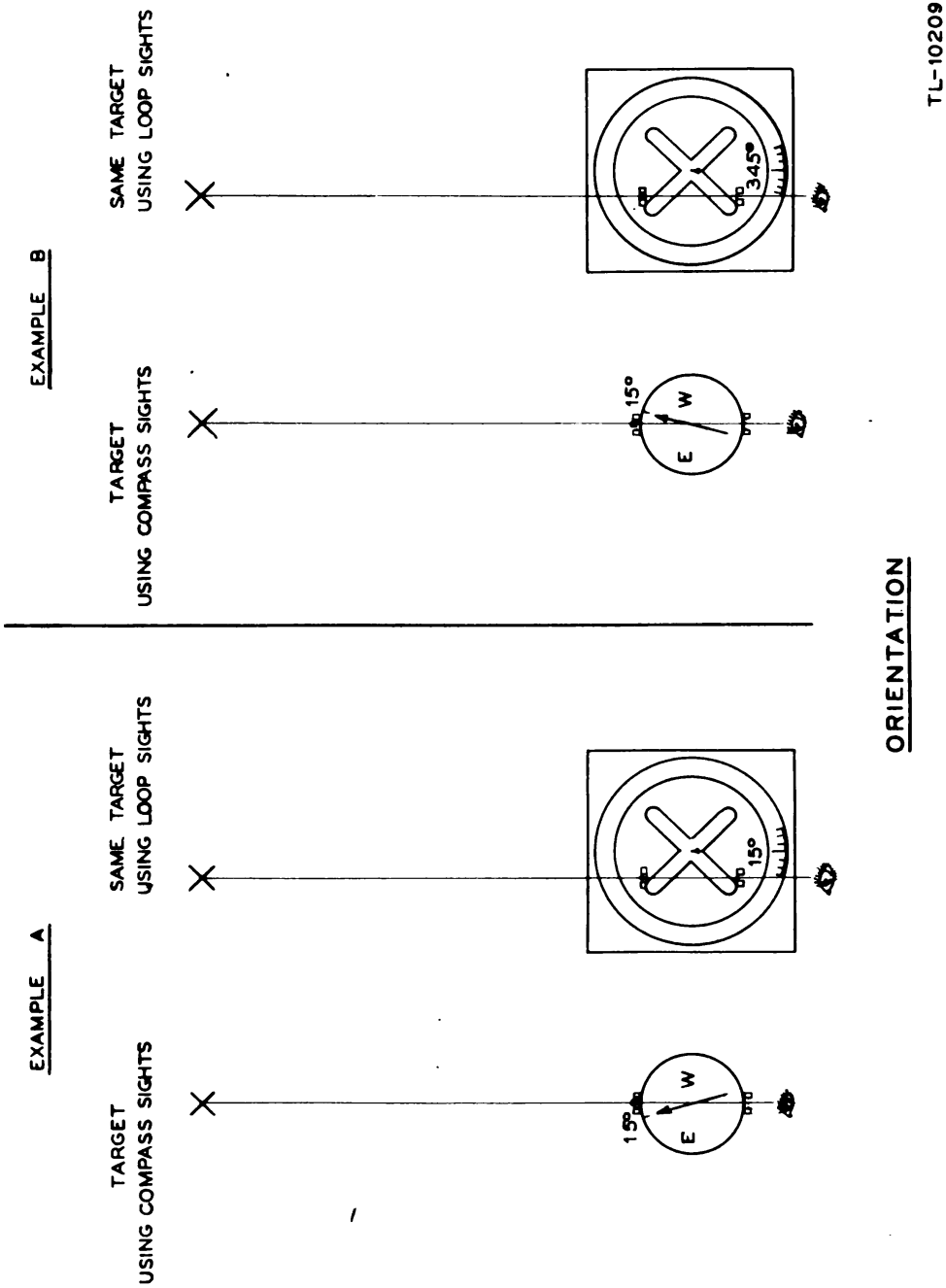
(3) Check the position of the 3 controls along the bottom of the front panel:

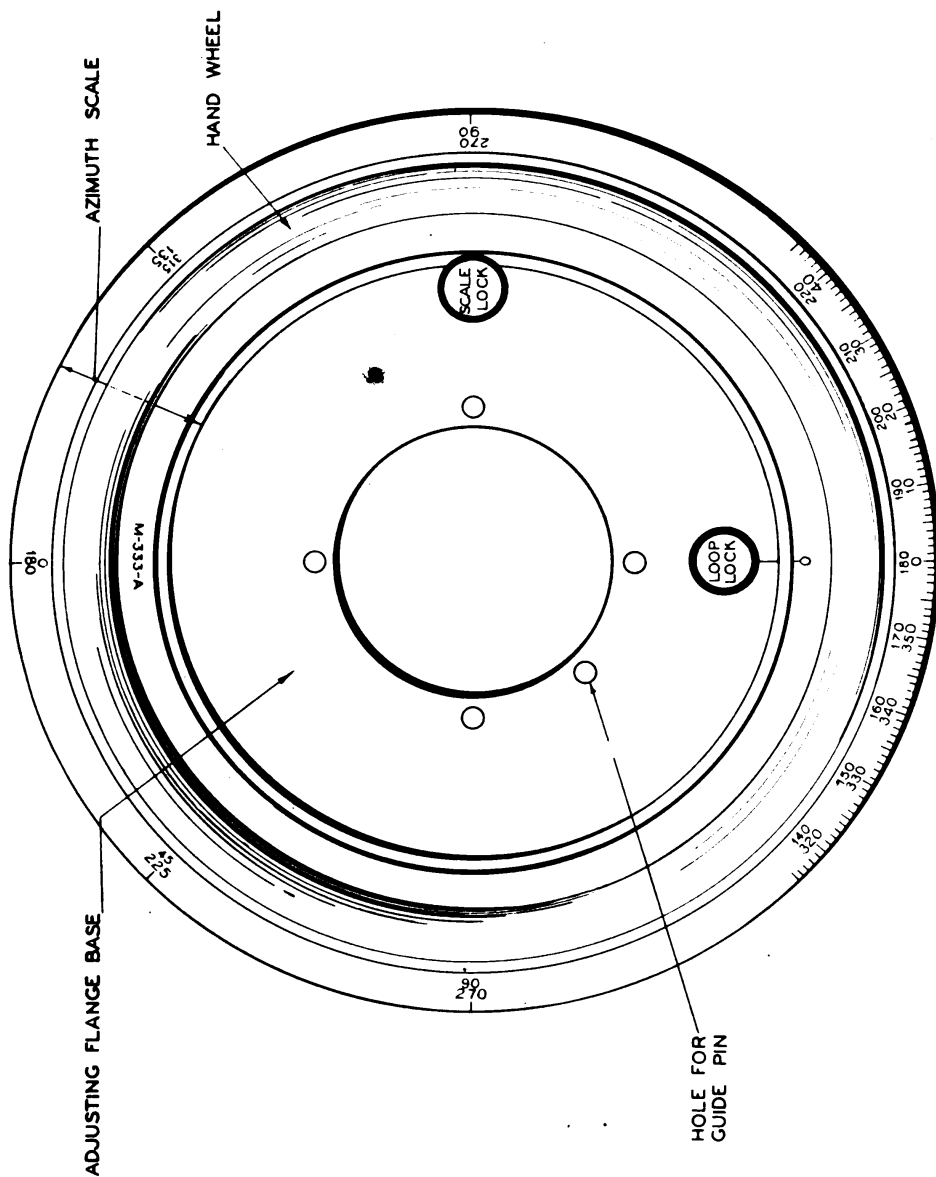
(a) Right side—Set the FREQ. BAND switch to the proper band.

(b) Left Side—Set the SENSITIVITY control in an approximate half-way position (about 5 on the dial).

(c) Center—PRESS TO BALANCE knob normal (in unpressed condition). Set the VOLUME control by turning it in the direction of the arrow (clockwise) to an almost maximum position.

(4) Tune in the desired station on the large frequency dial (marked KILOCYCLES), using the larger knob for fast tuning. Watch the rising of the pointers on the DIRECTION INDICATOR. If either one tends to go off scale (beyond a vertical position) reduce





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Figure 10. Azimuth Scale M-333-A and flange base, showing adjustments for loops and scale.



Figure 11. Radio Receiver BC-973-A, front view, showing controls.

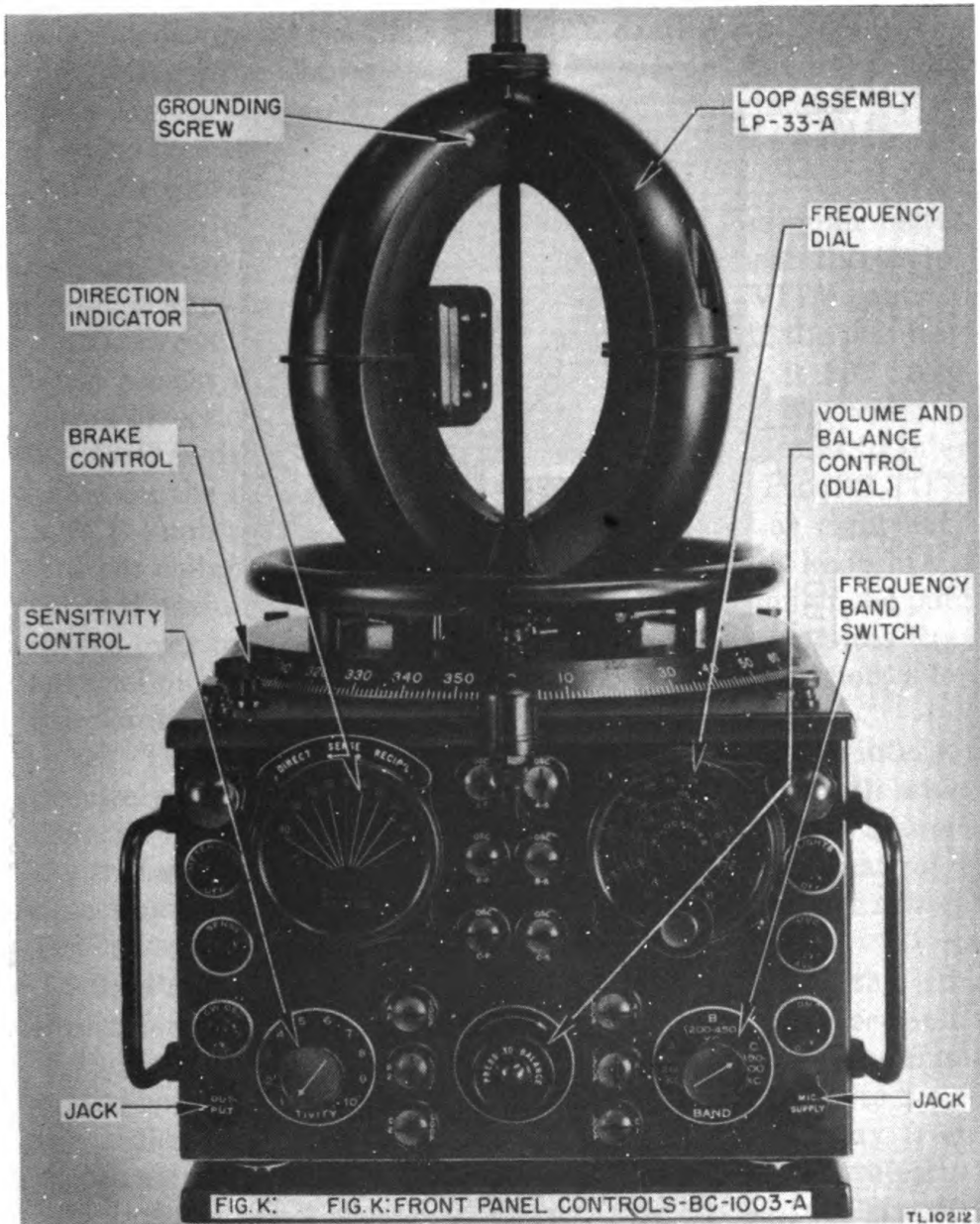


Figure 12. Radio Receiver BC-1003-A, front view, showing controls.

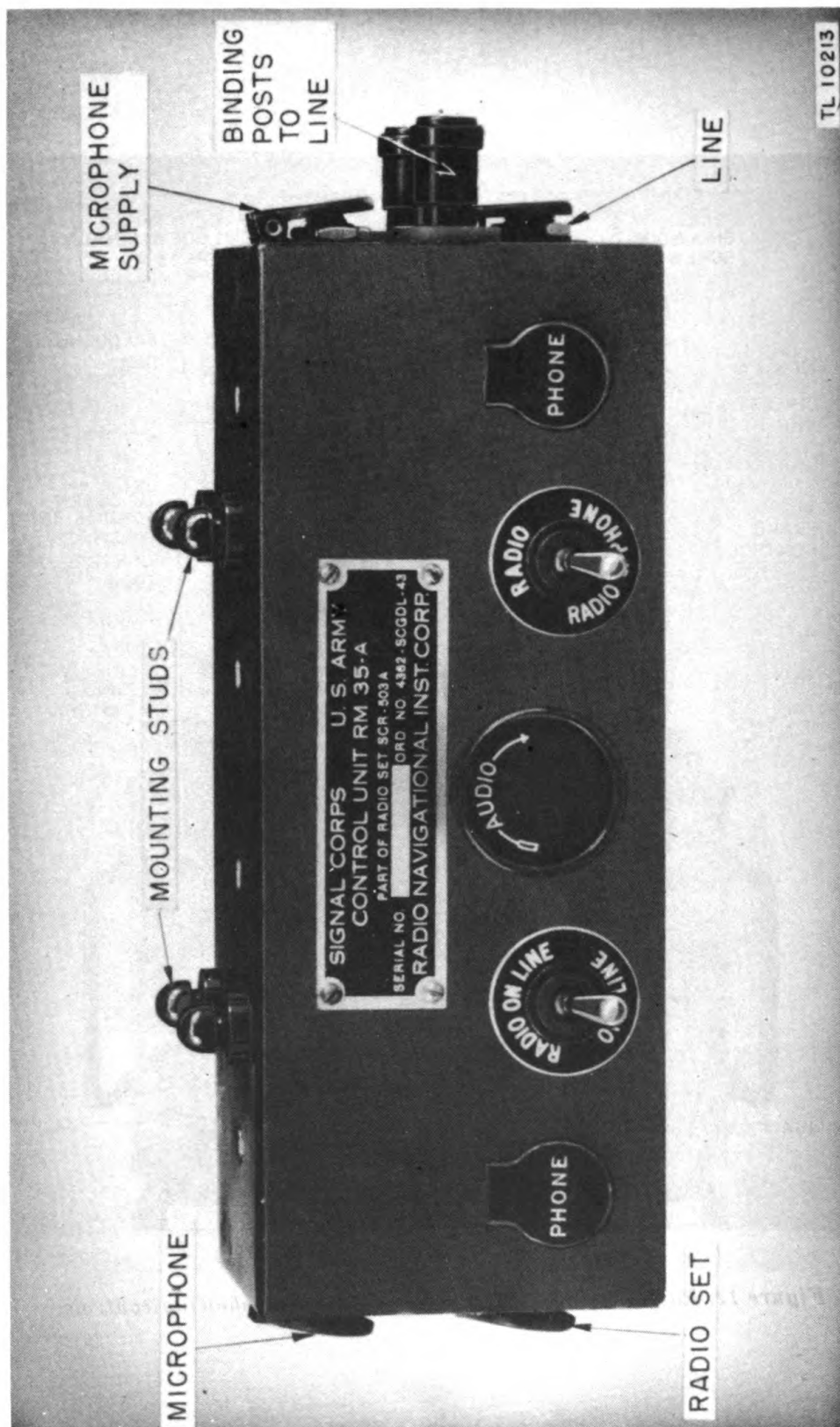


Figure 13. Control unit RM-35-A, front view.

the sensitivity to keep the pointer on scale; if one pointer does not rise enough to reach about mid-scale (orange line), advance the SENSITIVITY control to obtain a greater needle deflection. (At this point, audio volume can be adjusted to give comfortable volume in the phones. This does not affect the pointer deflection, which is controlled only by the SENSITIVITY control setting.)

(5) Turn the loop by its handwheel to bring the intersection of the pointers to roughly about the middle of the meter. (The loop must be free to rotate, LOOP LOCK released after having been set to its zero position.)

(6) Readjust the fine tuning control for maximum meter deflection. Keep the intersection of the pointers near the top of the center orange line by readjusting the SENSITIVITY control.

(7) Press the PRESS TO BALANCE knob. If the pointers collapse almost completely, the indicated direction is 90° from the actual direction. Release the knob and turn the loop wheel through 90° (either direction can be used) to get the pointers to intersect again on the mid-scale (orange) line. Press the PRESS TO BALANCE knob again. The pointers may move left or right but they will not collapse. Hold the PRESS TO BALANCE knob in the depressed position and turn it so that the intersection of the pointers moves over to the mid-scale (orange) line. This balances the dual channel output, regardless of bearing. Release the knob, allowing the pointer intersection to take its new position.

(8) Turn the loop wheel slowly to bring the pointer intersection precisely back to the mid-scale meter line. Loop azimuth scale will then be indicating either the direct or the reciprocal azimuth of the transmitting station. A direct azimuth is one originating in the direction which the loop sights indicate. A reciprocal azimuth is 180° away.

(9) Press the SENSE BUTTON to determine if the azimuth indication is direct or reciprocal. If the pointer intersection shifts to the left (or direct) side, the azimuth indicated by the numbers on the bottom of the azimuth scale is direct; if it shifts to the right, the indicated azimuth is reciprocal, that is, 180° away from the direct azimuth. In this case, the small red figures on the scale indicate the direct azimuth. The azimuth may be read directly on the white figures by turning the loop through 180° to again get the pointer intersection on mid-scale. In this case, press the SENSE button again to make certain that the intersection of the pointers now moves to the left.

(10) Make a final adjustment of tuning and balance to obtain

the most precise indication of the azimuth. (The azimuth scale reading obtained is an angle measured from the reference line originally chosen for the zero of the loop.)

(a) Automatic volume control. On fading signals, operation with automatic volume control is recommended. Throw the MVC-AVC switch located on right side to the AVC position for this type of operation.

(b) Beat frequency oscillator. For receiving unmodulated (continuous-wave) signals, such as code transmitters, operate the CW OSC.—OFF switch located on left side in the CW OSC. position, to produce an audible tone in the phones for code reception.

(c) Meter damping. For signals on which the meter pointers tend to rise and fall considerable (as in the case of radio range signals), turn on the METER DAMP switch. (This switch is located on the left side.) The action of this switch is to slow up the movement of the meter pointers.

b. Use of the Control unit. The purpose of Control Unit RM-35-A is to enable the direction finder operator to converse over a telephone line and to transmit signals received by the direction finder over the telephone line. To operate the control unit proceed as follows:

(1) Remove the headset from the receiver OUTPUT jack, and substitute patching Cord CC-66, plugging the other end of the cord in the control unit jack marked RADIO SET. (Refer to fig. 31 and fig. 13.)

(2) Insert the other patching cord, connecting the MIC. SUPPLY jack of receiver to the MIC. SUPPLY jack of the control unit.

(3) Plug in Headset HS-29, one plug in each control unit PHONE jack. The operator will hear radio set output from the left PHONE jack at all times.

(4) The output of the right PHONE jack will depend on the manipulation of the two toggle switches on the front of the control unit. These are used in the following manner:

(a) Normal operation — radio set output heard without telephone line: throw the right toggle switch to RADIO. Throw the left toggle switch to OFF LINE. In this position, the radio set output is also heard from the right PHONE jack, in addition to its being heard from the left PHONE jack.

(b) Temporary operation—telephone line heard for signal comparison: the left toggle switch remains at OFF LINE. Throw right toggle switch to RADIO & PHONE. In this position, the operator can listen to the line from the right PHONE jack, in addition to

the output of his own radio set from the left PHONE jack. Volume of the line is regulated by the AUDIO knob of the control unit.

(c) Temporary operation—radio set output transferred to telephone line: throw the left toggle switch to RADIO ON LINE. Throw the right toggle switch to RADIO & PHONE. This transfers the radio set output to the line so that it can be heard by the remote station, while the operator of the local station can hear the line from the right PHONE jack.

(5) To talk on the telephone line, insert the plug for Microphone T-35 into its jack. Set the switches in the position to give signals from the line on the right phone jack (as in par. (4) (b) above), that is, left toggle switch to OFF LINE and right toggle switch to RADIO & PHONE. Turn on the switch on the microphone to talk on the line.

7. OPERATION WITH FIXED LOOP.

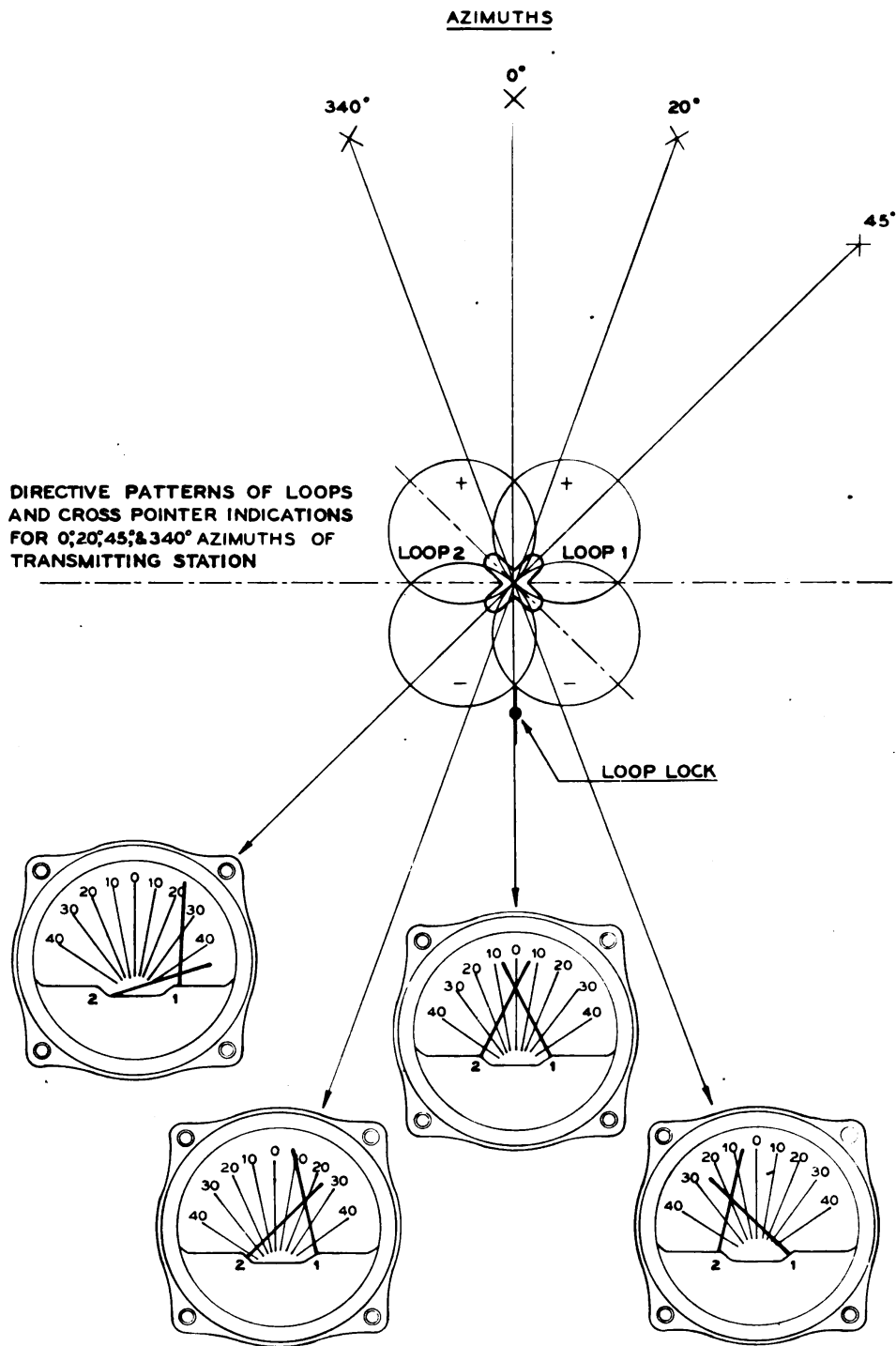
a. Operating with a fixed loop is often desirable, particularly in situations where the azimuth of a moving transmitter is being taken. Prepare the set for operation in the regular manner, but allow the loop to remain locked after setting it in its O position. The azimuth in this method of operation, is obtained by reading directly from the graduations on the DIRECTION INDICATOR dial, which will indicate angles up to 45° , on either side of the original 0° reference.

b. The regular instructions (with the exception of turning the loop) apply to this method of operation. Therefore, follow the procedure outlined in paragraphs 6a(1) through 6a(10), but do not unlock the loop. The receiver will thus be in a balanced condition. When the balance knob is released and the pointer intersection moves to its free position, the amount of deviation of the signal from the original zero, is read off directly in degrees (fig. 14).

c. This method of operation is also effective when a transmitter direction is being used as a homing course, since it acts as a continual check on the course being traveled. The meter reading gives an immediate indication of the number of degrees off-course.

8. EMERGENCY OPERATION.

a. Single channel null method (visual indication). (1) It will be noted that Radio Set SCR-503-A comprises two complete single loop direction finders, either one of which may be used to obtain azimuths by the null method, should the other loop circuit become damaged or inoperative due to unusual circumstances. The null



TL-10214

Figure 14. Crossed pointer indication.

can be obtained on the DIRECTION INDICATOR, giving a visual indication.

(2) For such emergency operation on a single loop and its channel, the azimuth scale must be rotated 45° to the left or right depending upon which loop is being utilized.

(3) The procedure for obtaining direction and sense indications is given below in two columns. Select the column that applies to the channel that is operative.

<i>Left-pivoted pointer</i> (Loop No. 2 and left channel operating)	<i>Right-pivoted pointer</i> (Loop No. 1 and right channel operating)
(a) Set LOOP LOCK, so that the loops are locked in normal position at 0° on the white azimuth scale.	(a) Set LOOP LOCK, so that the loops are locked in normal position at 0° on the white azimuth scale.
(b) Release SCALE LOCK, and turn azimuth scale to read 45° (white figs.) and restore SCALE LOCK to tightened position.	(b) Release SCALE LOCK, and turn azimuth scale to read 315° (white figs.) and restore SCALE LOCK to tightened position.

NOTE: The remaining steps in this procedure apply to either channel.

(c) Release the LOOP LOCK, and rotate the loop to null or minimum position of pointer. The scale will now read the line of bearing, which may be direct or reciprocal.

(d) Turn the loop 90° either side of the bearing obtained in (c) and press the SENSE button. The pointers will either rise or fall. Leave the loop turned in that direction which gave a new minimum. (The vertical antenna should be adjusted in length to give detectable differences in signal amplitude. This adjustment will vary with frequency. Refer to fig. 15.) Note the direction in which the loop must be turned away from the original null to get the new minimum, as this determines the sense: if turning of loop is *counterclockwise*, the original reading of the null bearing is direct, and is read off on the white azimuth scale; if turning of loop is *clockwise*, the original reading of the null bearing is reciprocal, and the *red* azimuth scale gives the correct bearing.

CAUTION: Be sure that the reading taken for the bearing is the one which gave the original null with the SENSE button in the normal position. In getting the new minimum with the SENSE button depressed, it is only the direction of turning that is important; no new reading is taken. Note the following examples. When the SENSE button is normal, and the null is at 210°, the azimuth may be either direct (210°, read on white scale) or reciprocal (30°, read on red

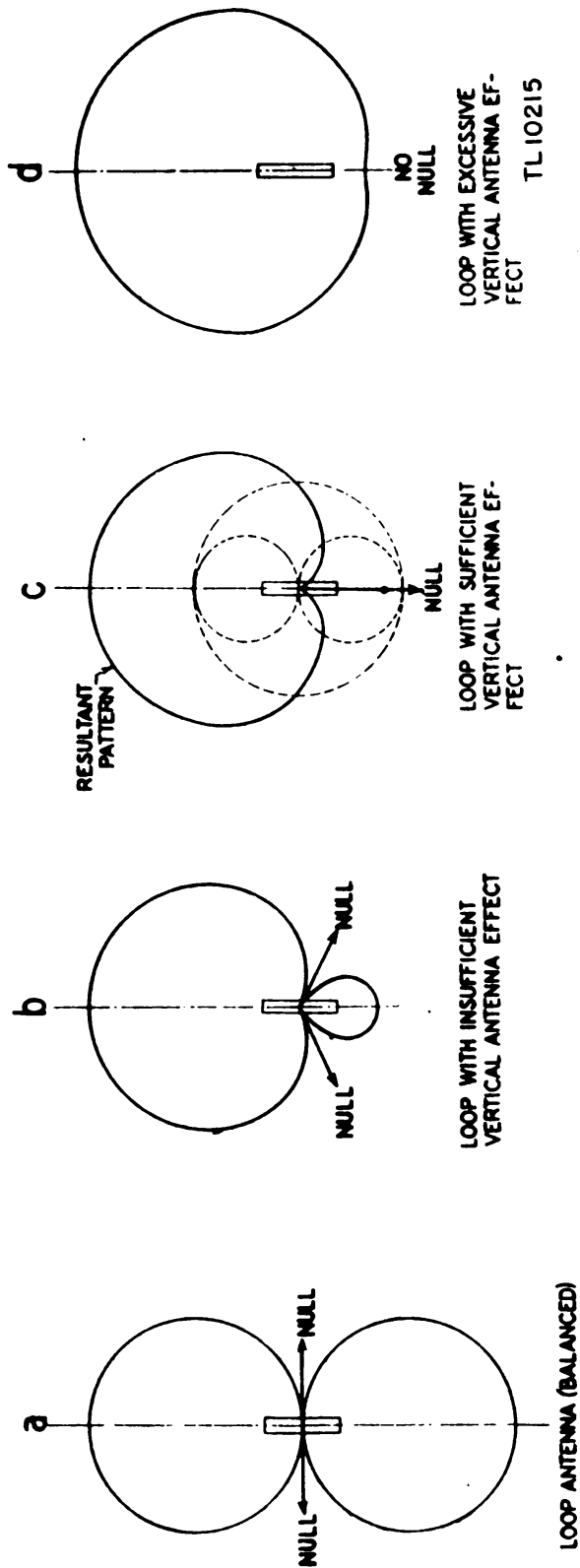


Figure 15. Diagram of loop patterns for emergency single channel operation using null method.

scale). When the SENSE button is depressed, the new minimum occurs when the loop is turned counter clockwise (decreasing numbers). The sense is therefore direct and the correct azimuth is 210° .

b. Audible method for obtaining null on phones if sense is not required.

(1) It will be further noted that the Radio Set SCR-503-A may be operated as a null method direction finder, using audible indications, by merely depressing the PRESS TO BALANCE knob and observing the position of the loop at which the DIRECTION INDICATOR pointers collapse or where zero signal is obtained in phones. This allows operation even if damage occurs to the DIRECTION INDICATOR.

(2) The procedure in this case is as follows:

(a) First, lock loops in the normal position with *white* azimuth scale reading 0° .

(b) Second, release the SCALE LOCK and turn the *white* azimuth scale to read 270° .

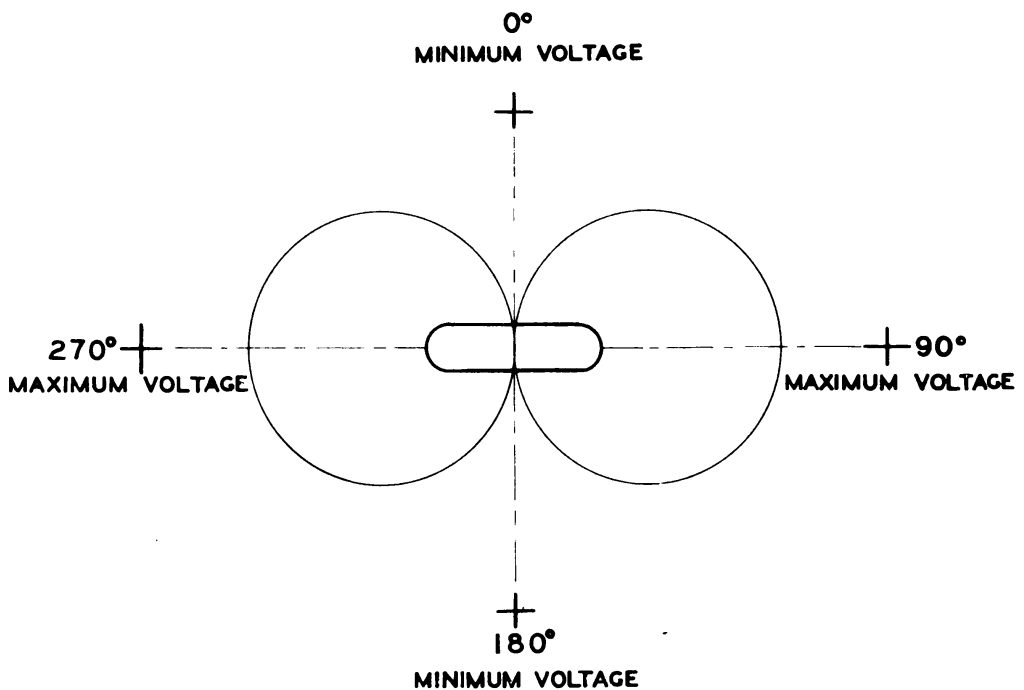
(c) Third, with the PRESS TO BALANCE knob held in the depressed position, rotate loops to null or zero signal position. The azimuth scale will now read the line of direct or reciprocal bearing. (On strong signals, the position of minimum signal can be used for null indication, provided the minimum is a definite and sharp one.) There is no reliable means of determining sense (i.e. direct or reciprocal) when using this method of emergency operation.

SECTION III

FUNCTIONING OF PARTS

9. PRINCIPLE OF DIRECTION FINDING WITH SINGLE LOOP.

a. A loop antenna connected to a receiver presents the simplest form of radio direction finding equipment. This results from the directivity pattern of the loop. That is, the response of a loop to a radio signal of fixed intensity, will vary as the position of the loop is rotated with respect to the signal. Figure 16 shows this action in the "figure 8" directive pattern, which demonstrates how the induced voltage of the loop varies according to the direction of the signal. This action for a single loop antenna forms the basis for the action of the double loop antenna used in the direction finding instrument Radio Set SCR-503-A.



TL10216

Figure 16. Basic loop response pattern.

b. In the diagram of the single loop (fig. 16) four possible directions of the radio signal (or azimuths) are shown, the crosses standing for the location of assumed transmitting stations. It will be seen that there are two directions (corresponding to the 0° and 180° bearings) where the loop response will be a minimum or null.

These occur when the direction of the signal is broadside to the loop. Similarly, there are two directions where the loop response is a maximum, or peak, corresponding to the 90° and 270° azimuths. These occur when the line of signal direction is in the same vertical plane as the loop. The resulting effect of these responses could be more easily visualized if they were observed on an appropriate meter in a receiver to which the loop was connected. Then, as the loop is rotated to get the azimuth of a particular station, there would be two positions of the loop where a null would be indicated by the meter. For reference purposes, these points would be marked off on a scale associated with the loop, called the azimuth scale. Since these two positions are 180° apart, one would be the *direct* azimuth, and the other, 180° removed from it, would be the *reciprocal* or *back* azimuth. To provide the correct sense for any one null reading, that is, to determine whether it is the direct or the reciprocal reading, an antenna could be used in conjunction with the loop, in a manner that is discussed in paragraph 12.

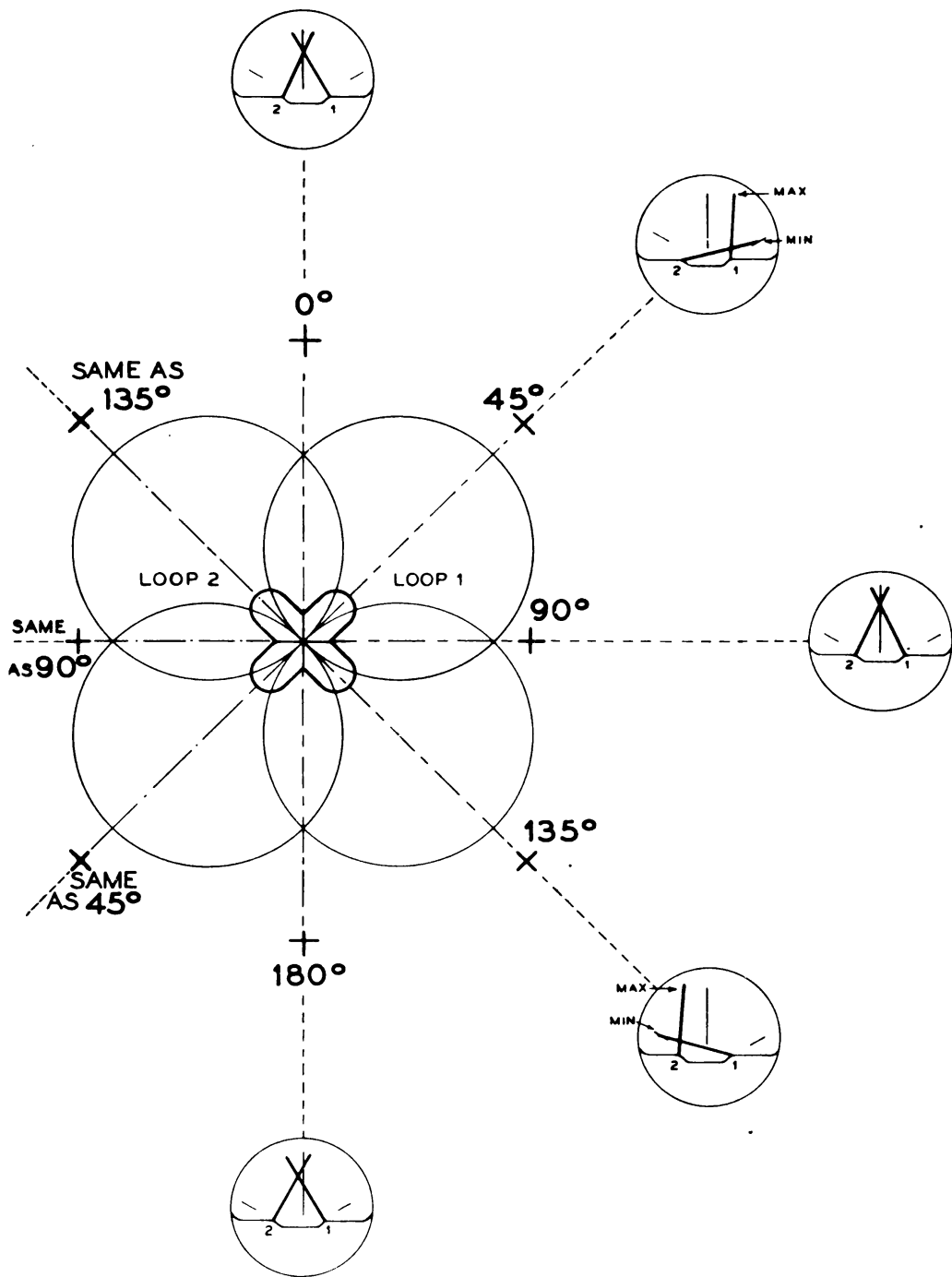
10. PRINCIPLE OF DOUBLE LOOP OPERATION.

a. In this direction finder, Radio Set SCR-503-A, two loops are employed. They are arranged at a fixed angle of 90° from each other, around a common vertical axis. In this arrangement, each loop acts independently to pick up the radio signal. The pattern of reception for the double loop combination, therefore, will be two "figure 8" patterns, arranged 90° from each other around the common center.

b. Figure 17 shows two outputs for each signal, such that a signal coming from a 45° azimuth and inducing a maximum voltage in one loop, at the same time induces a minimum voltage in the other loop. A signal coming from directly ahead, 0° azimuth, lies between the loops (bisecting the angle between them), with the result that both loops will develop equal voltages.

c. The result of the voltage developed by each loop can be observed by the indication of a separate meter pointer, which is connected, through its independent amplifying channel to its corresponding loop. The meter pointers for each channel are arranged on a common meter dial, and can be observed at the same time thus giving a resultant crossed pointer indication for each signal.

d. When the signal direction is halfway between the loops and the outputs of the loops are equal, the pointers will cross on the mid-scale line, if the amplification of each channel is made equal to the other by a balance control.



TL 10217

Figure 17. Double loop response pattern.

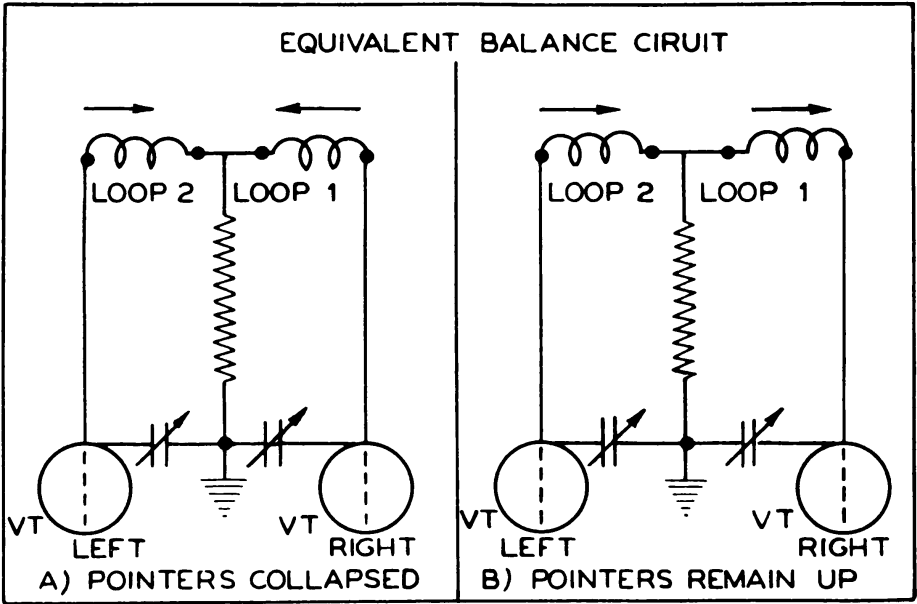
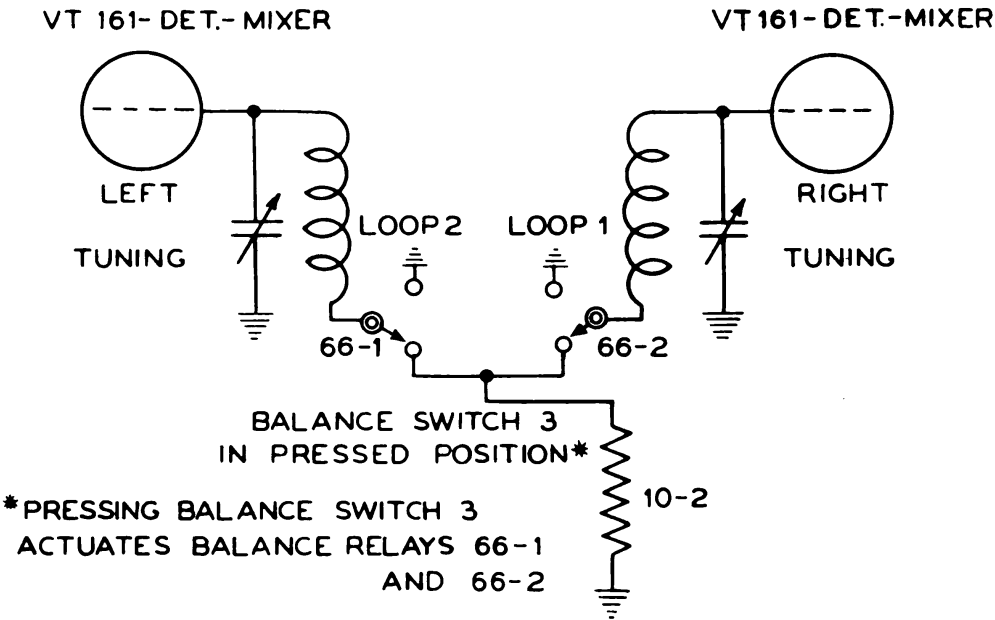
e. In figure 17, the crossed pointer indications are given for signals coming from various angles. It will be seen that, for the azimuths on one side of the pattern, after passing the 0° azimuth, there are two conditions when the crossed pointers intersect on the mid-scale line, corresponding to 90° and 180° azimuths and indicating equal outputs from each loop. There are two more conditions for this indication, produced by the signals on the other side of the loop, coming from 270° and 0° azimuths, thus making four cases in one complete rotation, when the desired crossed pointer condition is obtained. As a result, if the station is transmitting from a 0° azimuth and the loop is rotated through one complete circle, there will be four positions which give the desired indication, occurring at 0° , 90° , 180° , and 270° .

11. BALANCE CIRCUIT FUNCTIONING.

a. To get the one position which is the true azimuth, first rule out the two azimuths which are 90° off on either side (90° and 270°). This is done at the same time that the amplification of each channel is equalized in the balancing process.

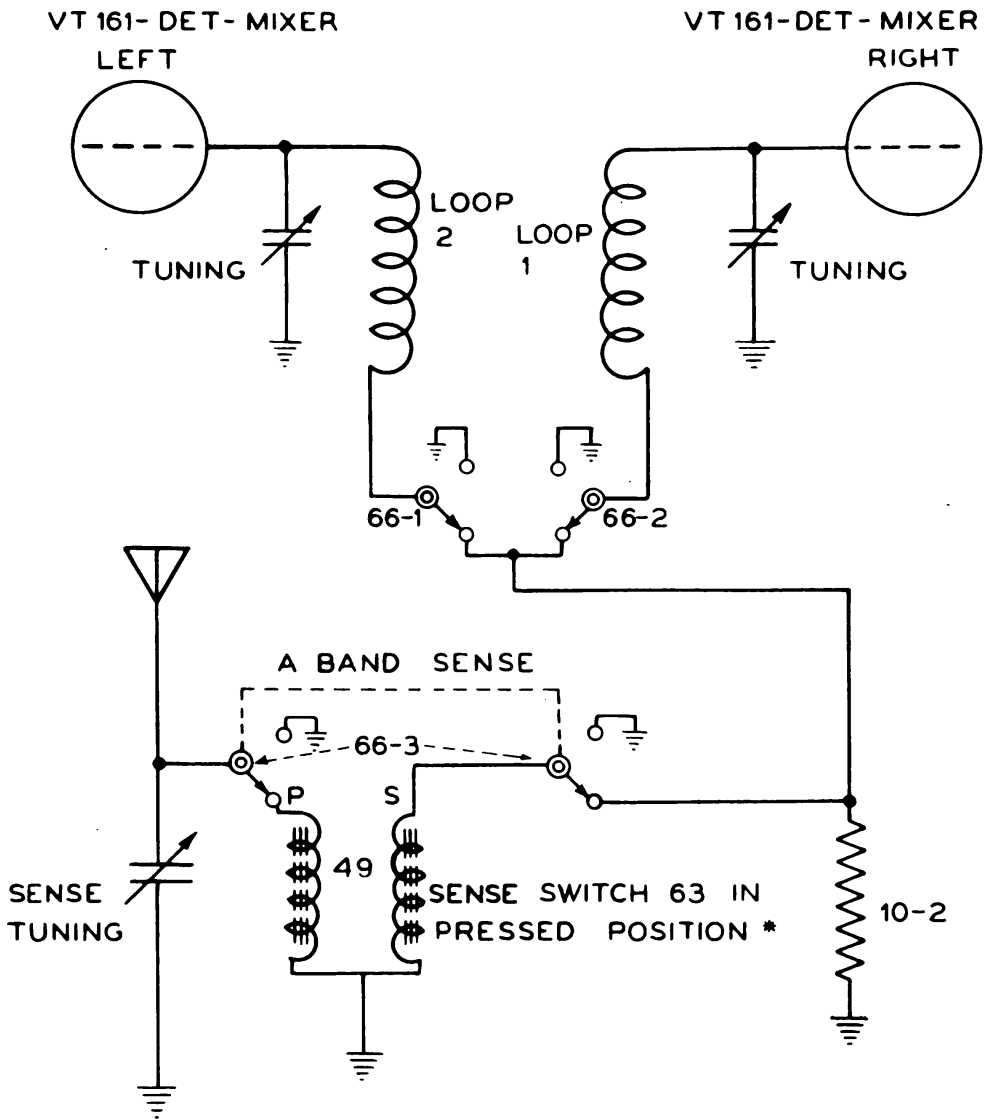
b. The balance circuit provides a means for equalizing the effective amplification in each channel, so that equal loop outputs will cause equal meter pointer indications. The functional circuit is shown in figure 18. It will be seen here that the balance switch is in the pressed position, disconnecting the low ends of each loop from ground and connecting them together. This puts the two loops in series (as shown in figs. 18 and 19). The result is similar to connecting two generators in series, thus applying the same resulting voltage to the first tube in each channel.

c. However, the amount of the resulting voltage produced will depend on whether the individual voltages in each loop are in the same or in opposite directions. Part A of figure 18 shows the loop voltages in opposite directions, which is the case when the loops have been turned 90° to either side, away from the position in line with the transmitting station. The effect of pressing the PRESS TO BALANCE control in this case, is to cause the voltages to oppose each other and produce practically a zero resulting voltage. This is shown by the abrupt falling or collapsing of the needles. On the other hand, if the loop voltages were in the same direction, as shown in part B of the diagram, the resulting voltage would be increased by the series connection, and the pointers would not fall. (There would not necessarily be a doubling of the r-f signal when the voltages add, as the resulting r-f current in the resonant circuit would now encounter twice the resistance it did formerly.)



TL10218

Figure 18. Radio Receiver BC-973-A, functional diagram of balance circuit for band A.



* PRESSING SENSE SWITCH 63 ACTUATES SENSE RELAY 66-3 AND BALANCE RELAYS 66-1 AND 66-2

TL10219

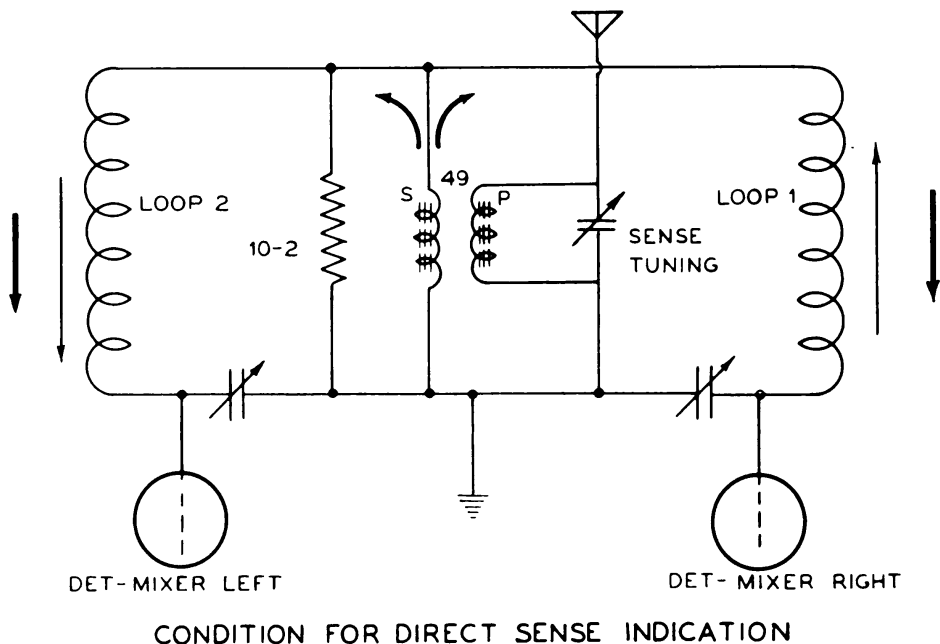
Figure 19. Radio Receiver BC-973-A, functional diagram of sense circuit for band A.

d. Referring once again to the case of a transmitting station directly ahead, it thus becomes very simple for the operator to distinguish the cases where the indicated azimuth is 90° off on either side from the true azimuth, by rejecting the response in the position when the pointers collapse during the balancing operation. This solves the two possibilities of 90° ambiguity, when the indicated response is 90° on either side of the true azimuth. The other two possibilities remain, namely, when the indicated response is either direct at 0° , or 180° away from it.

e. Removing the 180° ambiguity is discussed in paragraph 12 below. The process of balancing the circuit in the 0° or 180° position is completed by the balance control potentiometer. This control introduces resistance in one side of the output meter circuit, while subtracting it from the other side, to produce equal effective gain for each channel.

12. SENSE CIRCUIT FUNCTIONING.

a. The sense circuit is used to determine whether the obtained azimuth is direct or reciprocal. Taking the example of an azimuth of 0° , there is uncertainty or ambiguity between the signal coming



NOTE: LIGHT ARROW IS FOR LOOP CURRENTS, DARK ARROW IS FOR ANTENNA CURRENTS.

TL10220

Figure 20. Equivalent diagram of sense circuit.

from ahead if the azimuth is direct, or the signal coming from behind if the azimuth is reciprocal, since either signal produces the same indication.

b. Figure 19 shows the functional connections when the sense button is pressed. The voltage induced in the vertical antenna is thus introduced into the loop circuit, giving the equivalent electrical conditions shown in figure 20.

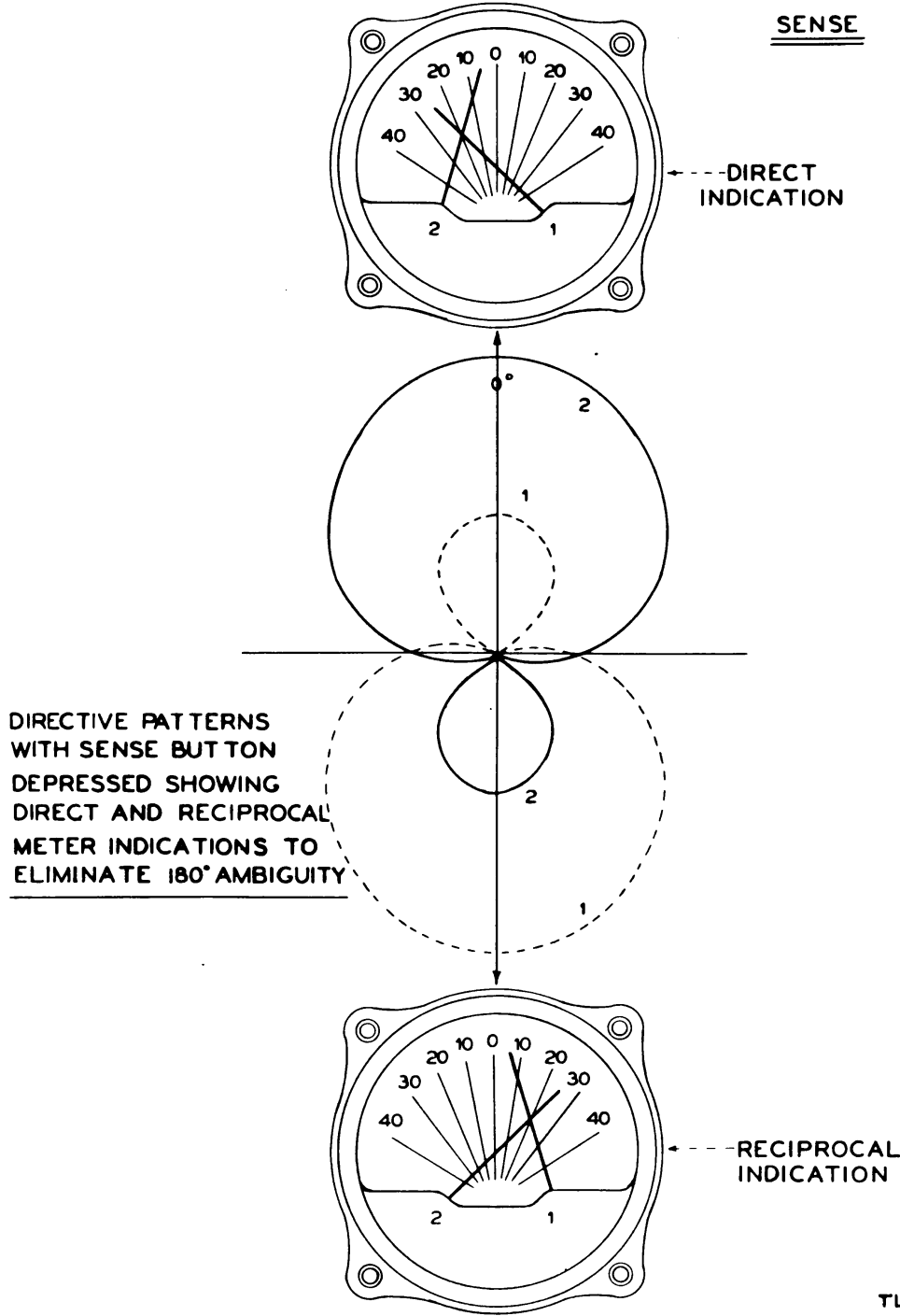
c. The antenna voltage from the secondary of the sense transformer 49 can now act on both loop circuits. The two loops, it will be noted, are again acting together in series, as they did in the balance circuit, since the sense button actuates the balance relays as well as the sense relay (figs. 29 and 30).

d. Under these conditions, the signal current due to the antenna flows through each loop. It produces a different effect in each loop, as shown by the arrows on the equivalent circuit diagram. The heavier arrows are for the signal current due to the antenna and the lighter arrows for the signal currents due to each loop. As shown, the antenna current opposes current of loop No. 1, producing a subtractive effect, and causing the DIRECTION INDICATOR pointer of this circuit to decrease its reading. In the circuit of loop No. 2, the antenna current aids the loop current, producing an additive effect which causes the other DIRECTION INDICATOR pointer to increase its reading. As a result, the intersection of the indicator pointers moves to the left indicating that the sense of the azimuth is direct (fig. 21). If the azimuth had been reciprocal, a similar analysis would show that the aiding and opposing action of the antenna current would occur in the opposite coils, and would, therefore, produce a crossed pointer movement to the right instead.

e. In actual operation, it is, therefore, a very simple matter to select the one desired azimuth from the four possible positions that give the same crossed pointer indications. Pressing the PRESS TO BALANCE control eliminates the two possible indications that are 90° off, and the pressing of the SENSE button immediately differentiates between the remaining two possibilities 180° apart, and gives the correct sense of the azimuths.

13. READING THE ANGLE DIRECTLY ON THE METER.

a. In the example thus far given, a station at a 0° azimuth would indicate 0° on the azimuth scale of the rotating loop, after the loop assembly had been swung around to obtain the desired crossed-pointer indication. Similarly, a station at a 20° azimuth would



TL-10221

Figure 21. Crossed pointer sense indications.

require the loop assembly and its associated scale to be swung around to the 20° mark on its scale in order to obtain the pointers crossing on the mid-scale line. Another method of obtaining the azimuth is reading directly from the markings on the DIRECTION INDICATOR, without rotating the loop. This method is good for direction finding with the loop in a fixed position.

b. If this method is used, the loop will be locked at 0° on its scale. In the case of a station transmitting from an azimuth of 20° , the loop voltages will no longer be equal and the intersection of the meter pointers will occur off the mid-scale line. Figure 14 shows that the location of the DIRECTION INDICATOR pointer intersection is related to the station azimuth. By means of the special graduation lines on the meter dial, the angle can be read off directly in degrees.

c. It will be noted that this reading depends on the relative responses of each loop and is independent of instantaneous signal strength. This method of operation is therefore particularly effective in obtaining the azimuth of a moving transmitter. It also makes it possible to tell, at any one moment, how far, in degrees, the line of the receiver is off a given course to a transmitting station.

14. RECEIVER CIRCUIT (figs. 34 and 35).

a. Each radio receiver has two channels which are practically separate receivers in themselves. The right channel drives the right pointer of the DIRECTION INDICATOR, in proportion to the signal picked up by loop No. 1; the left channel drives the left pointer according to the signal picked up by loop No. 2.

b. In each channel, the signal passes from the loop, through the loop appendage and the band switch, to one section of the tuning capacitor and the control grid of the detector-mixer. This tube amplifies the signal and, by heterodyne action with the output of the high-frequency oscillator, changes it from r-f to intermediate frequency. The i-f output of the detector-mixer is amplified by a two-stage i-f amplifier in BC-973, or a three-stage i-f amplifier in BC-1003, then applied to the second detector.

c. The second detector tube does three things at once. One diode section rectifies the i-f voltage, producing direct current to drive one pointer of the DIRECTION INDICATOR. The other diode section, which is connected to a different winding of the last i-f transformer, rectifies its i-f voltage for automatic volume control. The pentode section acts as a grid-leak detector which provides the audio signal heard through the headset.

d. Voltage from the meter-diode section of the second detector in each channel is applied to the corresponding element of the

DIRECTION INDICATOR, with one side of the balance control potentiometer in series. Turning the balance control knob while it is pressed in, reduces the resistance on one side and increases it on the other. Thus one element of the DIRECTION INDICATOR may be made more sensitive and the other less sensitive, to equalize the over-all gains of the two receiver channels.

Both channels use the same a-v-c voltage, the average of the d-c voltage produced by their respective a-v-c diodes. When the AVC-MVC switch is at MVC, the a-v-c bus is grounded, and its voltage eliminated. The output of the a-v-c diode in each channel is then absorbed entirely by the resistor connecting it to the a-v-c bus.

e. After passing through a resistance-capacitance filter circuit, which eliminates i-f voltage, the outputs of the pentode-sections of the two second detectors are connected in parallel. The resulting (average) signal is applied to the a-f amplifier which serves both channels. After amplification, the a-f signal passes through the volume control to the OUTPUT jack.

f. A beat-frequency oscillator is provided for reception of c-w signals. The CW OSC-OFF switch controls a relay which, when operated, applies plate voltage to this oscillator and couples its output to the screen grids of the two second detectors. A beat-note is produced in the detector, with frequency equal to the difference between that of the i-f signal and that of the b-f-o output. This note reaches the phones by way of the a-f amplifier in the usual way.

g. Two other items serve both channels: the sense antenna, and the h-f oscillator. Operation of the sense circuit is explained in paragraph 12. The h-f oscillator serves the same function as in any superheterodyne receiver.

SECTION IV MAINTENANCE

15. SERVICING.

Care should be taken in maintaining and servicing Radio Set SCR-503-A. *MEN IN THE FIELD WILL MAKE ONLY SUCH REPAIRS OR REPLACEMENTS THAT DO NOT REQUIRE SPECIAL TOOLS OR TEST EQUIPMENT.* Servicing and repair is authorized only by competent personnel supplied with adequate tools and instruments. An inexperienced operator, by trying to locate and repair troubles which a competent man could service in a few minutes may damage the equipment so that shipment to the depot for repairs is necessary. This applies especially to alignment and to indiscriminate tube replacement.

DO NOT ATTEMPT ALIGNMENT IN THE FIELD.

16. TROUBLE LOCATION AND REMEDY CHART.

When the set does not operate properly, check the items in the trouble chart before initiating a detailed examination.

TROUBLE CHART

<i>Trouble</i>	<i>Probable Causes</i>	<i>Remedy</i>
Radio set dead.	Power switch off. Open or shorted switch. Dynamotor disconnected from receiver.	Turn ON-OFF switch ON. Check Cord CD-673 between dynamotors and receiver (par. 5-14).
	Dynamotor disconnected from battery.	Check battery cable between battery and dynamotor. See that battery terminal wingnuts are tight. Clean the terminals if they are corroded.
	Blown fuse.	Examine the fuse in the positive lead of the battery cable and replace it if necessary (par. 20).
	Dead battery. Battery leads reversed.	Replace battery (par. 19). Connect red lead to plus (+) terminal and black lead to negative (-) terminal.
	Defective Cord CD-673	Replace Cord CD-673.

TROUBLE CHART (Contd)

<i>Trouble</i>	<i>Probable Causes</i>	<i>Remedy</i>
Both channels weak.	Defective or burned out oscillator tube.	Replace oscillator tube (par. 23).
	MVC-AVC Switch on AVC.	Set switch to MVC.
	Weak battery.	Recharge battery as per instructions on card attached to the battery. The battery voltage should always be kept above 10.2 volts. If necessary replace battery (par. 19).
	Wet loop.	Dry out loop.
One channel weak.	Loop trimmers out of track.	Align trimmers.
	SENSITIVITY control set too low.	Rotate SENSITIVITY control clockwise.
	Receiver out of alignment.	Align receiver (par. 25).
	Defective i-f tube.	Replace defective i-f tube in weak channel. (par. 23).
No audio output.	Channel out of track.	Retrack (par. 26).
	Open wire on loop coil.	Replace both loop coils.
	Defective mixer tube.	Replace mixer tube in weak channel (par. 23).
	Defective second detector tube.	Replace second detector tube in weak channel (par. 23).
	Intermediate-frequency out of alignment.	Align intermediate - frequency (par. 25).
	Wet loop.	Dry out loop.
	Headset HS-29 disconnected.	Insert one of headset plugs into jack marked OUTPUT on front panel of receiver.
	Defective volume control.	Replace or repair volume control. (Usually requires replacement of Dual Control Par. No. 106.)
	Shorted phone jack.	Replace or repair phone jack.
	VOLUME control OFF.	Turn VOLUME control clockwise.
	Defective audio tube.	Replace audio tube (par. 23).
	Defective Headset HS-29.	Replace Headset HS-29.

TROUBLE CHART (Contd)

<i>Trouble</i>	<i>Probable Causes</i>	<i>Remedy</i>
No audio output when using control unit.	Patching Cords CC-66 disconnected. Headset HS-29 not connected to Control Unit RM-35-A. Headset HS-29 connected to wrong jacks.	Connect patching Cords CC-66 (par. 5-14). Insert the headset plugs in the jacks marked PHONE on Control Unit RM-35-A. Insert the headset plugs in the jacks marked PHONE on Control Unit RM-35-A.
No microphone output.	Telephone line shorted. Switches on Control Unit RM-35-A in wrong position. Disconnected patching Cord CC-66 for microphone current. Microphone plug not inserted far enough to make contact.	Examine and correct. Set switches to correct position (par. 6b). Connect patching Cord CC-66 (par 5-14). Insert microphone plug as far as possible into jack marked MICROPHONE on Control Unit RM-35-A.
Compass needle does not rotate.	Needle lock not disengaged.	Disengage needle by turning knurled set-screw on bottom of compass counterclockwise (to the left).
No sense indication.	Sense Antenna AN-45-E not mounted. Battery voltage low.	Mount Sense Antenna AN-45-E and extend it. Use charged battery; operate relays manually.
Weak sense.	Sense antenna AN-45-E not extended.	Extend Sense Antenna An-45-E to at least 40 in.

17. LOCALIZING THE TROUBLE.

a. It is a tremendous job to check a complete radio set in order to find the part that is at fault. However, if the approximate location of the difficulty is first determined, the job resolves itself simply to checking a particular section very carefully. A good method of differentiating between intermediate frequency and radio frequency troubles is to switch to another band and see if a signal comes through. If it does the intermediate frequency is functioning and trouble is in either loop or oscillator circuit of the defective band.

If all bands are dead, the intermediate-frequency circuits must be checked thoroughly.

b. To localize the trouble, first consider the symptoms.

The following clues will be of help:

(1) If the DIRECTION INDICATOR shows a reading when a signal is tuned in but no audio is heard in the headset, the trouble is in either the audio output stage, the audio tube plate circuit, the output transformer and audio volume control circuit, or in the headset.

(2) If only the left pointer operates, the trouble must be in either the right i-f channel or in the right loop circuit.

(3) If the right pointer operates and the left does not, either the left channel or the left loop circuit is defective.

(4) It is possible to have a slight reading on the DIRECTION INDICATOR as a result of tube noise and still not be able to tune in any signal: If this condition is accompanied by a rushing noise in the headset when the SENSITIVITY and VOLUME controls are at a maximum, the source of difficulty is either the oscillator circuit or the loop circuit.

(5) Consideration of the preceding suggestions will partially localize the trouble. Electrical tests requiring a signal generator, d-c voltmeter and ohmmeter are now necessary to further narrow down the possible location of the defect.

c. If the trouble is in the audio (subpar. *b.* (1)), proceed as follows:

(1) Short the grid of the output tube intermittently to ground. If a clicking noise is heard in the headset, the tube and its output circuit are operating.

(2) If a clicking noise is not heard. The trouble has been localized. It is in the output circuit.

NOTE: Set ON-OFF switch to OFF and disconnect Cord CD-673 from the receiver before making resistance measurements.

(a) Now check the tube voltage and resistances and compare with figures 22, 23, 24, and 25.

(b) Check audio-output circuit for shorts or open circuits with the ohmmeter.

(c) Check the headset for continuity with the ohmmeter. **TURN THE VOLUME CONTROL TO MAXIMUM WHEN CHECKING THE HEADSET CIRCUIT.**

(3) If there is a clicking noise, it will indicate that the output tube is operating and that the trouble is in one of the earlier stages

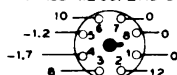
SENSITIVITY (R.F. GAIN) AT MAXIMUM

NO SIGNAL VOLTAGES

A+ VOLTAGE 12
B+ VOLTAGE 230MVC-AVC IN MVC POSITION
CW OSC-OFF IN OFF POSITION
(PUT ON FOR BFO ONLY)METER SENSITIVITY
1000 Ω PER VOLT

BOTTOM VIEW OF CHASSIS BC-973-A

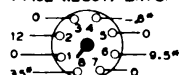
VT153 (12C6) 2ND DET.



VT153 (12C6) 2ND DET.



VT162 (12SJ7) B.F.O.



VT 209

12SG7

2ND I.F. AMP



VT 209

12SG7

2ND I.F. AMP



VT134 (12A6) AF AMP



VT 209

12SG7

1ST I.F. AMP



VT 209

12SG7

1ST I.F. AMP

-6.3 (3 MC)
-13. (2 MC)1.8 (2 MC)
3.5 (1 MC)

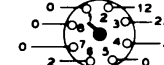
GRID

TERMINAL STRIP
FOR H.F. OSC.

VT161

12SA7

DET-MIXER



VT161

12SA7

DET-MIXER

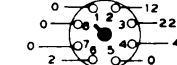
* TO MAKE THIS READING THE C.W. OSC.
SWITCH MUST BE ON.H.F. OSC.
H.F. OSC. ASSEMBLY
LOCATED
ON TOP OF
CHASSIS

PLATE PIN NO 3 - 115 VOLTS

BAND SW

FRONT

VOLUME

TL-10222

Figure 22. Radio Receiver BC-973-A, tube socket voltages.

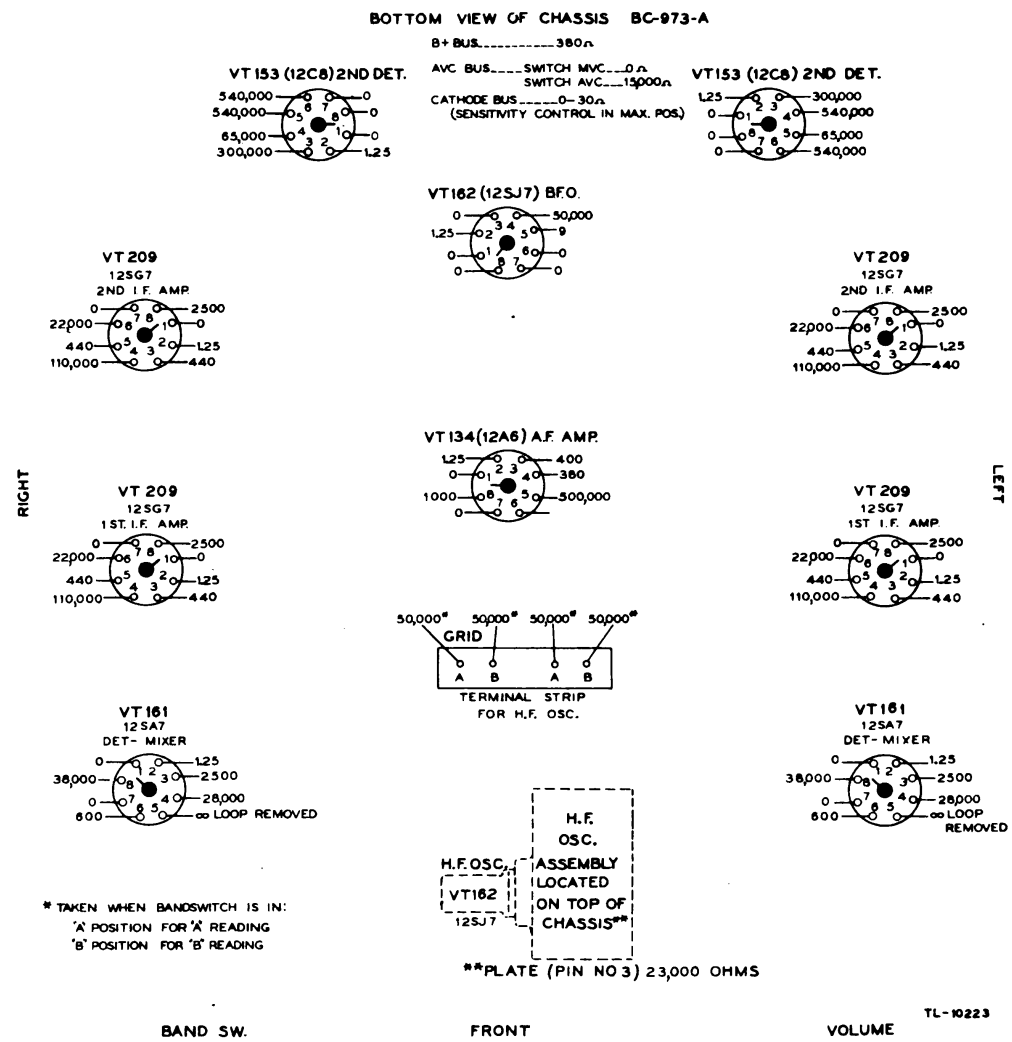


Figure 23. Radio Receiver BC-973-A, tube socket resistances.

SENSITIVITY (RF GAIN) AT MAXIMUM
NO SIGNAL VOLTAGES

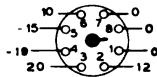
A+ VOLTAGE = 11
B+ VOLTAGE = 220

MVC-AVC IN MVC POSITION
CW OSC-OFF IN OFF POSITION
(PUT ON FOR BFO ONLY)

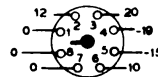
METER SENSITIVITY
1000 Ω PER VOLT

BOTTOM VIEW OF CHASSIS BC-1003-A

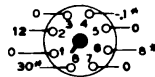
VT153 (12C8) 2ND DET.



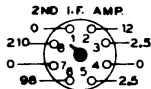
VT153 (12C8) 2ND DET.



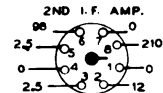
VT162 (12SJ7) BFO



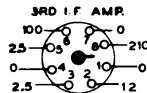
VT209
12SG7



VT209
12SG7



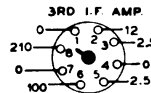
VT209
12SG7



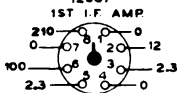
VT134 (12A6) A.F. AMP.



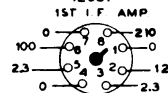
VT209
12SG7



VT209
12SG7



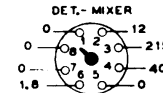
VT209
12SG7



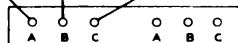
VT161
12SA7



VT161
12SA7



-6. (1MC) -5. (450KC) -2.5 (200KC)
-1.5 (450KC) -2. (200KC) -1.5 (100KC)



GRID
TERMINAL STRIP
FOR H.F. OSC.

H.F. OSC.
ASSEMBLY
LOCATED
ON TOP OF
CHASSIS **

* - TO MAKE THIS READING THE CW OSC.
SWITCH MUST BE ON

** PLATE (PIN NO 3) - 100 VOLTS

BAND SW.

FRONT

VOLUME

TL-10224
5623

Figure 24. Radio Receiver BC-1003-A, tube socket voltages.

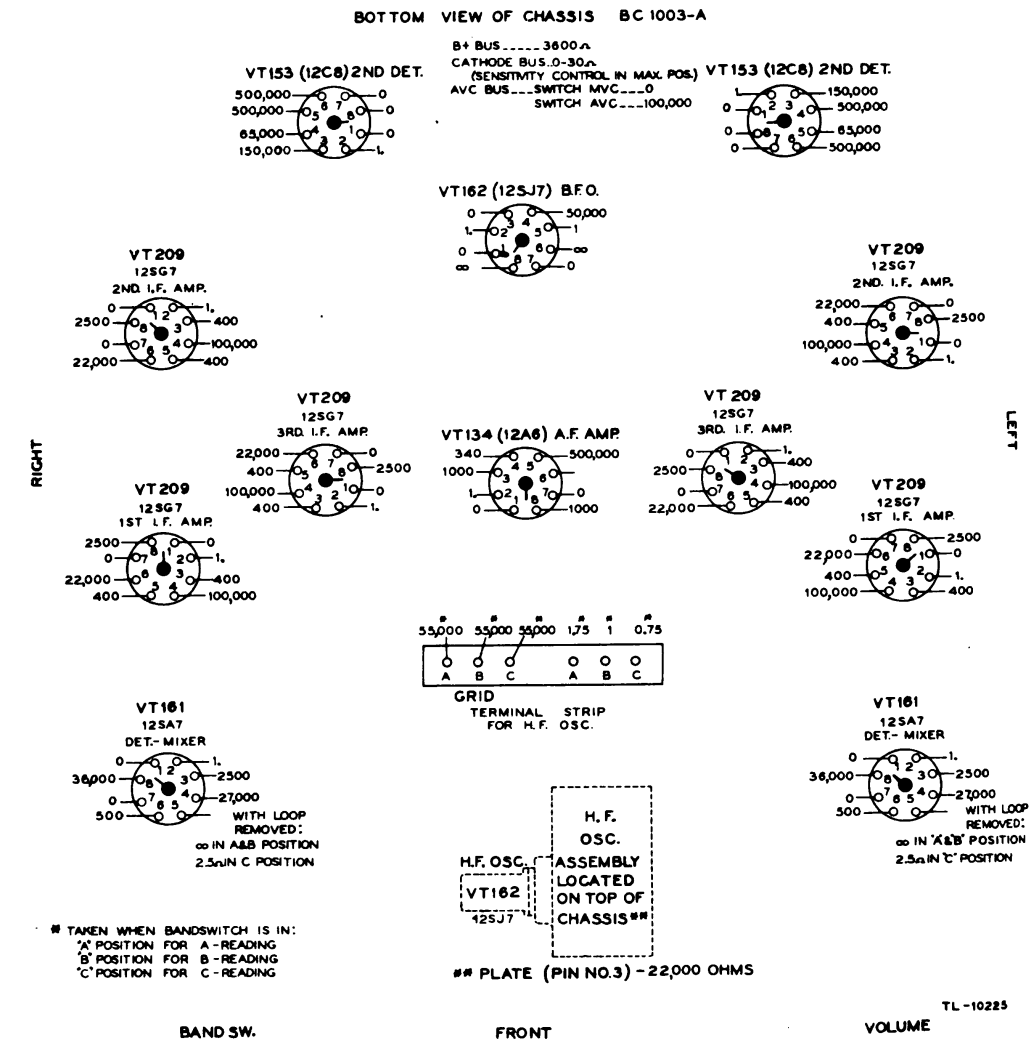


Figure 25. Radio Receiver BC-1003-A, tube socket resistances.

such as the second detector. Check its circuit and measure the voltages. See that grid caps are securely in place and grid leads firmly connected at both ends.

(4) If the defect in the audio system is in one channel only, this can be determined by feeding a signal into the loop antenna and rotating it until null in the audio is heard. Check the audio null position with indication of DIRECTION INDICATOR. This will show that the audio trouble is in one channel only and will assist in tracing down the source of trouble.

d. If the left channel is defective (subpar. *b.* (3)) determine which stage is defective by the following procedure:

(1) Feed the output of the signal generator to the grid of the last i-f tube. (Refer to alignment instructions, par. 25, for additional details on the use of the signal generator.)

(2) If the DIRECTION INDICATOR shows a reading when the sensitivity is approximately correct as described in paragraph 6-a then this stage is not the defective one.

(3) Move the signal generator to the grid of the preceding stage. If this stage proves to be defective, check the circuit by means of the voltmeter and ohmmeter in order to locate the trouble.

(4) If this stage is not defective, move to the next preceding stage until the defect is located.

e. If the right channel is defective (subpar. *b.* (2)) determine which stage is defective by following the procedure outlined in subparagraph (*d*) above.

f. If the trouble is in the oscillator or loop circuits (subpar. *b.* (4)) a very simple check will show whether or not the oscillator is working.

(1) Measure the voltage on the oscillator grid or on one of the wires connected to it with a voltmeter of at least 1,000 ohms per volt. This voltage should be negative as indicated on figures 22 and 24.

(2) If there is no grid voltage, then check the voltage of the oscillator coils, bandswitch, oscillator tube and oscillator section of the tuning capacitor.

(3) If these are satisfactory, the trouble must be in the loop circuit.

18. CLEANING OF CONTACTS.

a. Relay contacts. (1) Relay contacts become noisy after they have been subjected to considerable use. This causes a very loud click in the headphones whenever the PRESS TO BALANCE or

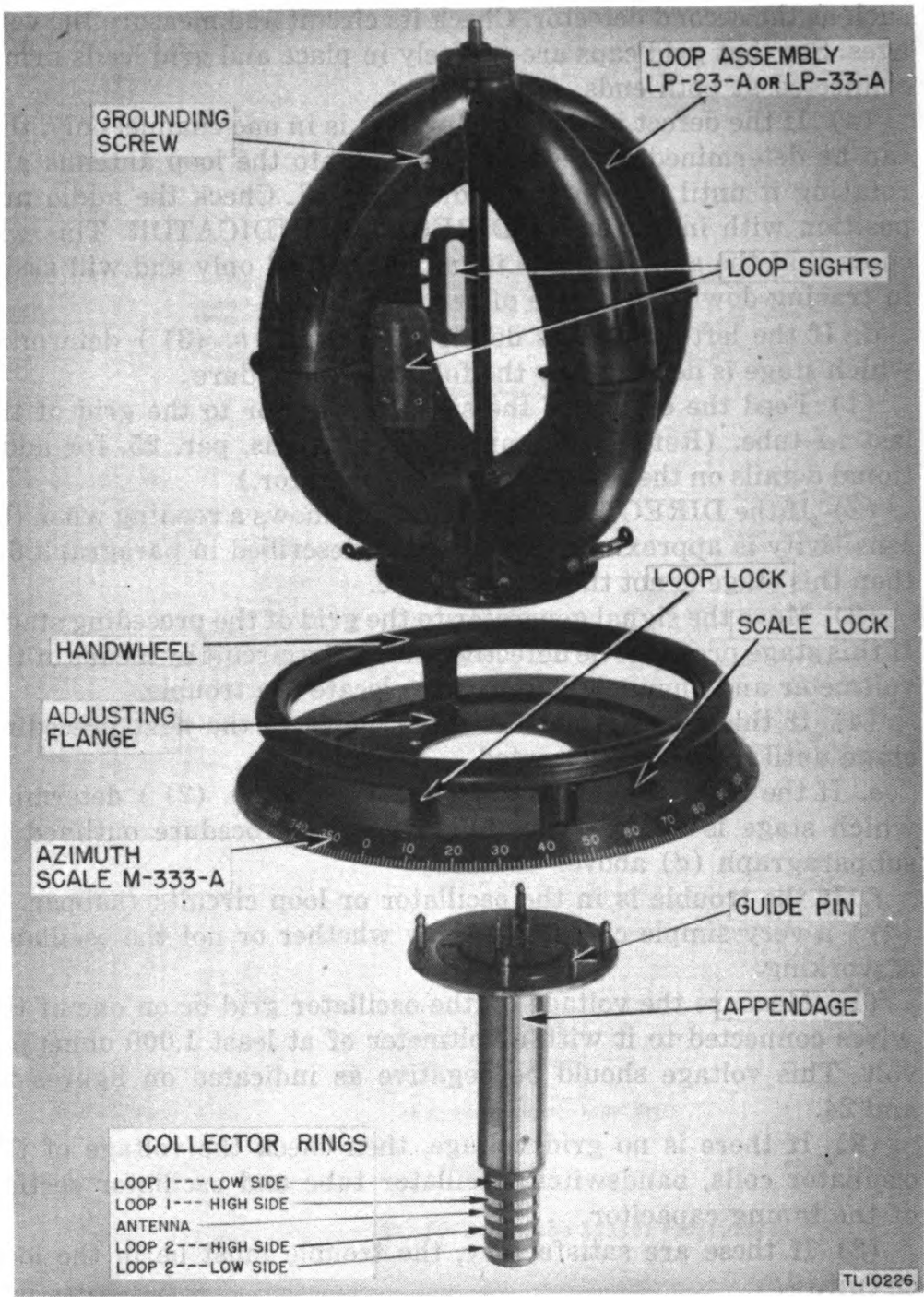


Figure 26. Loop assembly and appendage.

SENSE controls are pushed. This clicking may be reduced by cleaning the contacts with a small cloth that has been saturated with carbon tetrachloride. Use relay burnishing tool, if it is available, after cleaning. The relay contacts in this set are gold plated; use no harsh abrasives in cleaning them.

(2) Dirty relay contacts may easily show up as an uncertainty of direction indication when the set is subject to a light mechanical vibration such as rapping it on the side with the palm of the hand. These symptoms would clearly indicate a relay cleaning to be needed.

b. Loop commutator. The loop commutator may become dirty and cause the pointers of the DIRECTION INDICATOR to show an intermittent indication as the loops are rotated. Usually it is possible to locate the defective section of the commutator as the pointers will behave in an erratic manner whenever a certain portion of the azimuth scale is facing the index line. Clean and lubricate commutator as follows:

(1) Remove the loop commutator (par. 24a) and clean the commutator rings with a lintless cloth saturated in carbon tetrachloride.

(2) After cleaning, apply a VERY LIGHT FILM of lubricating oil Special AXS 637 or equal to the commutator rings.

c. Battery terminals. Battery terminals corrode quite easily due to chemical action, especially the positive terminal. Use a knife to clean off this corrosion which interferes with the making of good contact and then coat the terminals with petrolatum.

19. BATTERY REPLACEMENT AND CARE.

a. Open Chest CH-113-A.

b. Remove the shelf by releasing the four sash fasteners.

c. Unscrew the wingnuts on the battery terminals.

d. Remove the battery leads from the battery terminals.

e. Replace the old battery with spare from Chest CH-139-C. BE SURE THE TERMINAL LUGS ARE NEAR THE REAR OF THE CHEST.

f. Connect the battery leads. CONNECT THE RED LEAD WITH THE FUSE TO THE POSITIVE TERMINAL OF THE BATTERY.

g. Replace the shelf and close the chest.

h. Battery. Putting Dry-charged Exide Aircraft Battery into service.

(1) This battery is shipped with the plates in a partly charged condition. The vent plugs must be left tightly in place until ready to fill the battery. The electrolyte to use for filling is diluted sulphuric acid. It must be pure and suitable for storage battery use and of 1.280 specific gravity. If desirable, it can be prepared from pure sulphuric acid of any specific gravity higher than 1.280 by mixing this acid with approved water in the proper proportions; for example, $2\frac{3}{4}$ parts of water by volume with each part of 1.835 sp. gr. (66° Baumé) acid.

CAUTION: In mixing this electrolyte always pour the acid into the water. NEVER POUR THE WATER INTO THE ACID, AS THIS IS DANGEROUS. Use only glass, hard-rubber or lead containers for mixing electrolyte and later for pouring it into the cells.

(2) To prepare battery for service:

(a) Unscrew the vent plugs from the cells. (6-TS-7B, 6-TS-9A, 6-TS-7H, and 6-TS-9G are shipped with corks in cover holes and the vent plugs are shipped separately. Remove and discard corks.)

(b) Fill each cell with 1.280 specific gravity electrolyte. *The temperature of the filling electrolyte should not exceed 90° Fahrenheit (32° Centigrade).* With types AC, AC-A, TS, TX, XT, fill to a height even with the splash cover inside the cell. With types ACS, FHM, TAS, TAS-A, TAS-B, TS-A, TS-B, TS-D, TS-F, TS-G, TS-H, fill to $\frac{3}{8}$ inch above protector on top of separators.

(c) Allow the battery to stand at least one hour after filling with electrolyte. If level has fallen, add more electrolyte to restore it. Replace vent plugs in cells. If any electrolyte was spilled on battery, it should be removed with a cloth slightly dampened with a solution of baking soda and water.

(d) A freshening charge should be given before placing in service, the charge rate being shown in table below. Make certain the positive terminal of battery (marked POS or + or painted red) is connected to positive of charge circuit and negative terminal of battery (marked NEG or — or painted black) is connected to negative of charge circuit.

(e) Charge until four consecutive hourly readings show no rise in specific gravity for the lowest cell. If charge rate below is maintained, length of charging time will be at least 18 hours, lower rates will increase the time. If temperature exceeds 110° F., reduce charging rate.

(f) After completion of charge, the specific gravity should be between 1.275 and 1.300 with the level as mentioned in paragraph

2. If it is not, adjust by removing some solution and replacing them with approved water or electrolyte as required. Charge for an hour to mix solution before testing again.

(g) Maximum capacity is based on an electrolyte temperature of 80° F. at beginning of discharge and on full charge specific gravity of 1.300 corrected to 80° F. with electrolyte level as mentioned in paragraph 2.

INITIAL CHARGE RATE IN AMPERES

Plates	7	9	11	13	17	19
AC, AC-A, ACS.....	$\frac{3}{4}$	—	1	—	—	—
FHM	—	—	—	$5\frac{1}{2}$	—	—
TS, TS-B, TS-F, TS-H..	1	$1\frac{1}{4}$	—	2	—	—
TX	—	2	—	$2\frac{1}{2}$	—	4
XT	—	—	—	3	—	—
TAS, TAS-A, TAS-B { TS-A, TS-D, TS-G {	—	$2\frac{1}{2}$	—	$3\frac{3}{4}$	5	—

20. FUSE REPLACEMENT.

- Open Chest CH-113-A.
- Remove the shelf by releasing the four sash fasteners.
- Disconnect the battery leads and remove the cartridge from spring clip.
- Open the fuse cartridge by pressing the top in and turning it to the left (counterclockwise).
- Replace the blown fuse by a spare fuse which is located in the middle of the top shelf in this chest.
- Close the cartridge by pushing the top in and turning to the right (clockwise).
- Replace cartridge in the spring clip.
- Connect the battery leads. **CONNECT THE RED LEAD WITH THE FUSE TO THE POSITIVE TERMINAL OF THE BATTERY.**
- Replace the shelf and close the chest.

21. DYNAMOTOR BRUSH REPLACEMENT AND BEARING LUBRICATION.

- Open Chest CH-113-A.
- Remove the shelf by releasing the four sash fasteners.
- Disconnect the power cable from the dynamotor.
- Remove the dynamotor from the chest by releasing the snap slides on the bottom of the dynamotor filter.
- Remove the battery cable from the dynamotor.

f. Carefully remove the short, twisted wire on one of either end of the dynamotor, depending on whether you wish to replace the high or low-voltage brushes. The high-voltage brushes (these are the smaller brushes) are on the same side as power Socket SO-69 and the low-voltage brushes (M-61 —, M-61 +) are on the same side as the battery cable socket.

g. Unscrew the two screws and remove the end cover.

h. After each 500 hours of use, lubricate the dynamotor as follows:

(1) Remove the two screws which hold the grease retaining plates at each end of the dynamotor.

(2) With a toothbrush and a piece of clean cloth remove the old grease from outer side of bearing.

(3) Repack the outer side of each bearing with a small amount of General Purpose Grease No. 2 (USA-Spec. 2-108) or equal.

(4) Replace the grease retaining plates, being careful not to damage the paper gasket.

i. Unscrew the two knurled black bakelite screws and remove the brushes.

j. Replace the worn brushes by the spare brushes which are in the small bag attached to the dynamotor.

k. Screw the two bakelite screws in tightly.

l. Replace the end cover and screw in the two end screws.

m. Replace the twisted wire which keeps the end screws from turning.

n. Connect the battery cable to the dynamotor and then place it back in the chest.

o. Connect the snap slides to the studs in the bottom of the chest.

p. Connect the power cable to the dynamotor.

q. Replace the shelf and close the chest.

22. PILOT LIGHT REPLACEMENT.

a. Remove the pilot-light cover spring which holds the reflecting cap.

b. Remove the pilot-light reflecting cap by pulling on it until it snaps out of its groove.

c. Remove defective light bulb by unscrewing it, and replace it with a spare bulb taken from phone compartment in cover of receiver Chest CH-103-A.

d. Snap on the reflecting cap.

e. Replace the pilot-light cover spring.

23. TUBE REPLACEMENT.

a. Locate the defective tube or tubes by following the procedure given in paragraph 17.

b. Replace the defective tubes with spares, one at a time, until the trouble is cleared up. Use the spare tube kit in which the tubes are labeled for position. If these spares are not available, the matter of replacements requires some additional care. For example, the amplification characteristics of the replacement tube may differ materially from its mate in the other channel. In extreme cases this may cause the amplification of one channel to differ from the other channel by more than the amount of adjustment provided by the balance control, especially for settings of the SENSITIVITY control near minimum.

c. Should this be the case, try other tubes until one is found that permits the channels to be balanced at all settings of the SENSITIVITY control. This selection of tubes can best be made using a signal generator connected as described in paragraph 25.

d. If replacement tubes are not available, it is frequently possible to equalize the amplification of the two channels by switching tubes, one pair at a time, from one channel to the other.

NOTE: If mixer or i-f tubes are replaced, check operation carefully and if necessary, align the receiver as described in paragraph 25.

24. REMOVAL AND ASSEMBLY OF PARTS.

a. To remove commutator mechanism.—(1) Remove the loop by releasing the four slide fasteners at the base of the loop.

(2) Remove the azimuth scale (fig. 26).

(3) Remove the top cover by unfastening the four cams. The cams are in an open position when the engraved arrows on the knurled knobs face directly to the rear of the set. In order to release the knobs turn them in a counterclockwise direction.

NOTE: In replacing this cover, it is necessary that the four arrows be facing the rear, otherwise difficulty will be encountered in seating the cover of the housing.

(4) Turn the commutator assembly until the four flat head screws can be seen through the holes in the flat portion of the commutator assembly. Remove the four screws. Now lift the commutator assembly carefully and slowly in an upward direction. In replacing the commutator mechanism, rotate the annular disc which has the four holes, until these holes line up with the holes in the top plate of the commutator assembly. Then insert the commutator

slowly and carefully, moving it in a downward direction until these four holes line up with the corresponding four holes in the top of the pedestal, in order that the flat head screws may be replaced.

b. Access to the tubes and other units on the top side of the chassis. Follow the first three steps outlined in subparagraph *a* above.

c. Access to the bottom of the chassis.—(1) Remove the receiver from mounting Plate FT-363-A by releasing the two outer slide fasteners, pulling them forward.

(2) Remove the bottom plate by unscrewing the four corner screws.

d. To remove commutator brushes.—(1) Remove the receiver from the mounting plate.

(2) Remove the bottom plate by unscrewing the four corner screws. To inspect, clean, or replace the six silver commutator brushes, unscrew the threaded brush holders from the square aluminum can mounted on the center of the chassis.

e. To remove the DIRECTION INDICATOR.—Unscrew the four screws and pull it forward.

25. ALIGNMENT.

a. Alignment of Radio Receiver BC-973-A (fig. 27).

(1) Remove the loop, antenna handwheel, and the top cover as outlined in paragraph 24*a*.

(2) Connect commutator prong terminals marked HI together.

(3) Connect terminals marked LO together.

(4) Set signal generator to 458 kc and check with frequency calibrator or frequency meter.

(5) Connect hot side of signal generator to HI terminals of commutator.

(6) Connect low side of signal generator to the slide fastener latch stud on top of the commutator assembly.

(7) Set the SENSITIVITY control to approximately 8½ on its scale.

(8) Set switches on the front panel to following positions:

METER DAMP-OFF	—OFF
CW OSC-OFF	—OFF
ON-OFF	—ON
MVC-AVC	—MVC
LIGHTS ON or OFF	

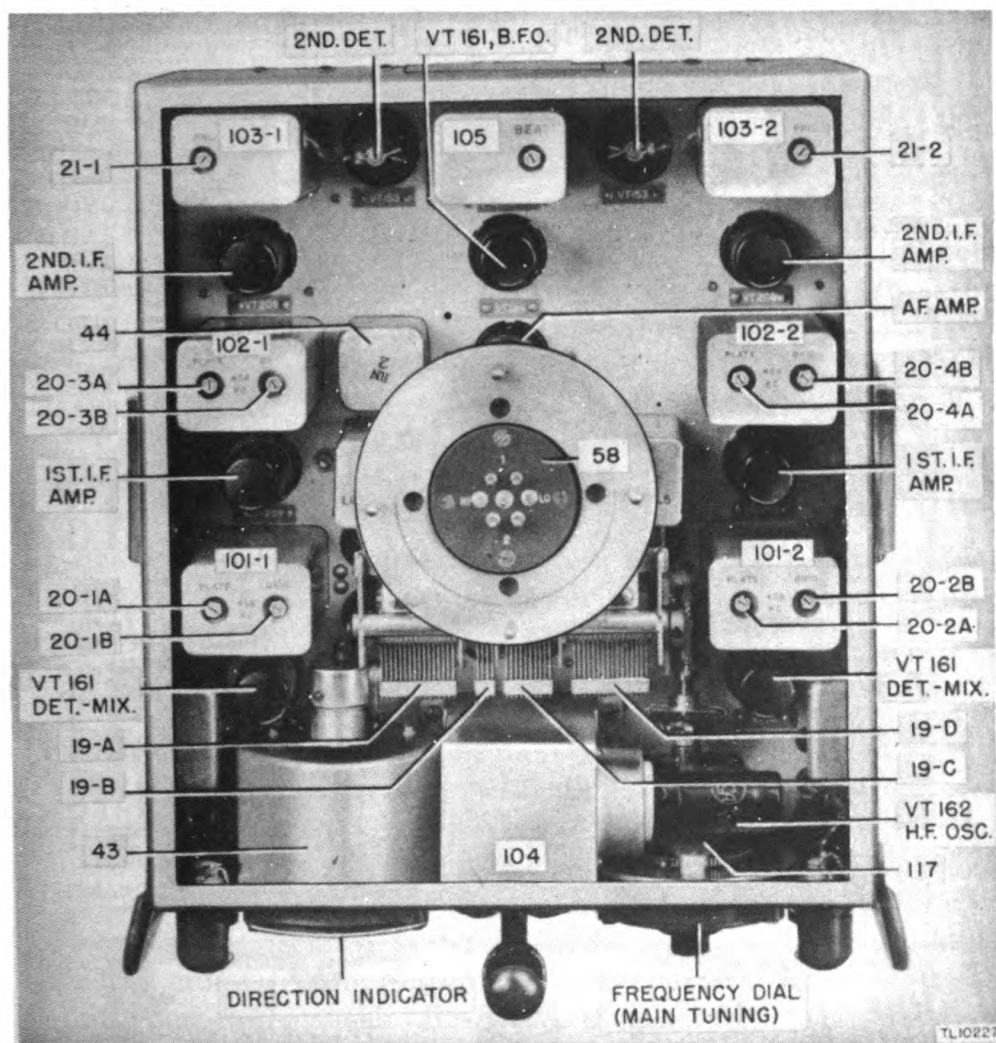


Figure 27. Radio Receiver BC-973-A, top view.

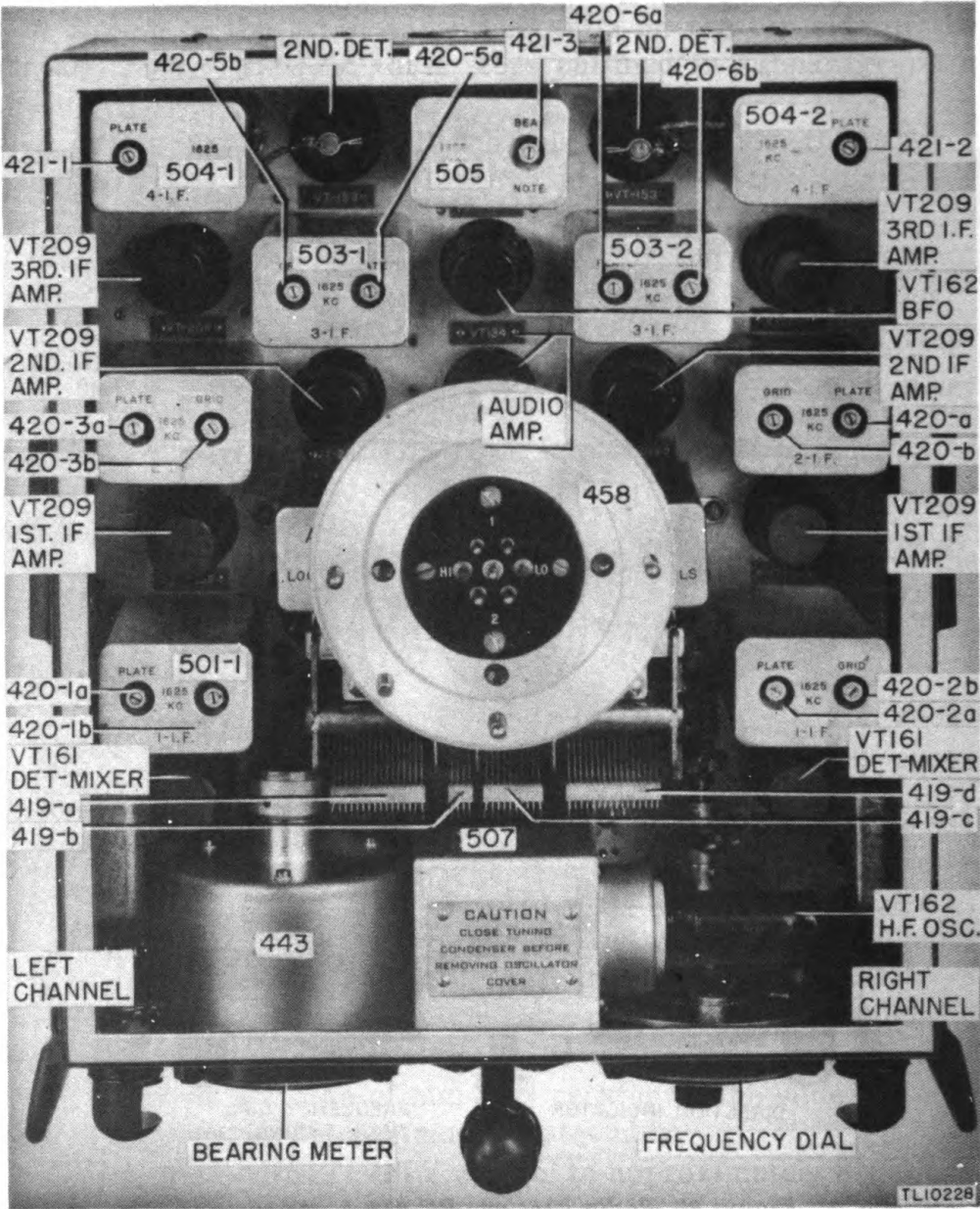


Figure 28. Radio Receiver BC-1003-A, top view.

- (9) Set receiver frequency dial to 2,000 kc on B-band.
- (10) Turn frequency bandswitch to B.
- (11) Turn up the output of signal generator until halfscale indication of pointers of DIRECTION INDICATOR meter is noted. If no indication is obtained on DIRECTION INDICATOR from either channel, proceed as follows:
 - (a) Connect the hot lead of the signal generator to the grids of the second i-f tubes.
 - (b) Trim the third i-f transformers for maximum pointer deflection.
 - (c) Move the hot lead of the signal generator to grids of the first i-f tubes.
 - (d) Trim the second i-f transformers for maximum pointer deflection.
 - (e) Connect the hot lead of the signal generator to HI terminals of the loop commutator. If an indication is obtained on the DIRECTION INDICATOR proceed with the alignment.
- (12) Press the PRESS TO BALANCE control and adjust the generator output so that the pointer tips just come together on zero centerline.
- (13) Adjust i-f trimmers to obtain maximum pointer deflection in the corresponding channel, lowering the signal generator output, if necessary.
- (14) Rebalance, if necessary.
- (15) Repeat the adjustment using extreme care to obtain actual peak.
- (16) Check the perfection of alignment by turning the signal generator frequency dial slowly both above and below resonance. Observe the path followed by the intersection of the DIRECTION INDICATOR pointers. With the set balanced, this intersection should follow the 0° line exactly. If the path of the intersection wobbles sidewise, the alignment is not perfect. Repeat alignment operations and recheck alignment, if necessary.
- (17) When maximum perfection of alignment by peaking has been achieved, the final correction can be made by turning the frequency dial of the signal generator to the off resonance point at which the sidewise movement (wobble) of the pointer intersection was noted. Turn the plate trimmers of i-f transformers in the channel controlling the lower pointer until this pointer is equal in height to the opposite pointer.
- (18) Repeat the alignment and touch-up processes several times if necessary to achieve perfect alignment.

b. Alignment of Radio Receiver BC-1003-A (fig. 28).

(1) Remove loop, antenna handwheel, and top cover as outlined in paragraph 24a.

(2) Connect commutator prong terminals marked HI.

(3) Connect terminals marked LO.

(4) Set signal generator to 1,625 kc and check with frequency calibrator or frequency meter.

(5) Connect hot side of signal generator to HI terminal of commutator.

(6) Connect low side of signal generator to LO terminal of the commutator.

(7) Set the SENSITIVITY control to approximately $8\frac{1}{2}$ on its scale.

(8) Set switches on front panel to the following positions:

METER DAMP-OFF	—OFF
ON-OFF	—ON
CW OSC-OFF	—OFF
MVC-AVC	—MVC
LIGHTS-OFF	—as required

(9) Set receiver frequency dial to 200 kc on the B band.

(10) Turn FREQ BAND switch to B.

(11) Turn up the output of signal generator until half-scale indication of pointers of DIRECTION INDICATOR is noted. In the event no indication is obtained on DIRECTION INDICATOR from either channel, proceed as follows:

(a) Connect the hot lead of the signal generator to the grids of third i-f tubes.

(b) Trim the fourth i-f transformers for maximum pointer deflection.

(c) Move the hot lead of the signal generator to grids of the second i-f tubes.

(d) Trim the third i-f transformers for maximum pointer deflection.

(e) Connect the hot lead of the signal generator to grids of the first i-f tubes.

(f) Trim the second i-f transformers for maximum pointer deflection.

(g) Connect the hot lead of the signal generator to HI terminal of the loop commutator. If an indication is obtained on the DIRECTION INDICATOR proceed with the alignment.

(12) Adjust the PRESS TO BALANCE control and generator output so that the pointer tips just come together on zero centerline.

(13) Adjust i-f trimmers to obtain maximum pointer deflection in corresponding channel, lowering signal generator output, if necessary.

(14) Rebalance if necessary.

(15) Repeat the adjustment, using extreme care to obtain actual peak.

(16) Check perfection of alignment by turning signal generator frequency dial slowly both above and below resonance. Observe the path followed by the intersection of the DIRECTION INDICATOR pointers. With the channels balanced, this intersection should follow the 0° line exactly. If the path of the intersection wobbles sideways, the alignment is not perfect. Repeat alignment operations and recheck alignment, if necessary.

(17) When maximum perfection of alignment by peaking has been achieved, make the final correction by turning the frequency dial of the signal generator to the off resonance point at which the sidewise movement (wobble) of the pointer intersection was noted.

(18) Turn the plate trimmers of i-f transformers in the channel controlling the lower pointer until this pointer is equal in height to the opposite pointer.

(19) Repeat the alignment and touch-up processes several times if necessary to perfect the alignment.

26. OSCILLATOR TRACKING.

a. In all oscillator tracking adjustments and b-f-o adjustments, unless otherwise noted, the switches on the front panel shall be in the following positions:

METER	DAMP-OFF—OFF
CW OSC-OFF	—OFF
ON-OFF	—ON
MVC-AVC	—MVC
LIGHTS-OFF	—as required

b. To track Radio Receiver BC-973-A, B band proceed as follows:

(1) Connect the signal generator to a loop of wire consisting of four or five spaced turns approximately 3 inches in diameter.

(2) With the direction finder completely assembled, that is, top cover, handwheel and loop in position, set it up approximately 2 feet away from the transmitting loop. If the transmitting loop is too close to the direction finder, inaccurate tracking will result due to mutual inductance between transmitting and receiving loops. If the transmitting loop is too far away, the signal strength may fall

below the required amount. The leads to the transmitting loop should always run in a direction away from the direction finder and preferably should be in coaxial cable properly grounded.

(3) Set the radio receiver **FREQ. BAND** switch to **B**.

(4) Rotate the tuning dial of the receiver to exactly 3,000 KC.

(5) Set the signal generator accurately at 3,000 KC. (Check with frequency calibrator or frequency meter.)

(6) Turn Radio Receiver BC-973-A ON and after a warm-up period of approximately 5 minutes, set the **SENSITIVITY** control to about 6 or 7 on the dial.

(7) Adjust the signal generator output until deflection is noted on the **DIRECTION INDICATOR**.

(8) Adjust oscillator parallel trimmer marked **OSC-B-P** until maximum deflection of the pointers is obtained. (It may be necessary to reduce the output of the signal generator progressively as this adjustment is made.)

(9) Now resonate the loop trimmers on front panel marked **LOOP B-1** and **LOOP B-2** very carefully until an absolute maximum indication of each of the pointers is obtained. If the indication of the pointers appears to be unequal, rotate the loop with respect to the transmitting antenna until the intersection of the pointers occurs on the zero bearing line. If when **PRESS TO BALANCE** control is pressed, the needles drop completely, rotate loop antenna 90°.

(10) To check the perfection of the loop trimmer adjustments (assuming the intermediate frequency was previously found to be perfect), rock the signal generator frequency a small amount both below and above 3000 KC and observe the path followed by the intersection of the pointers. If this intersection follows the zero bearing line of the meter exactly, the loop trimmer adjustment is perfect. If any sidewise motion of the intersection is observed, repeat the loop trimmer peaking operation outlined above.

(11) Rotate the frequency dial of the receiver to exactly 2000 KC (with the **FREQ. BAND** switch still on **B**).

(12) Rotate the signal generator dial to approximately 2000 KC, and rock it about this point until maximum **DIRECTION INDICATOR** pointer deflection is obtained.

(13) If necessary, increase the signal generator output until a deflection is observed on the **DIRECTION INDICATOR**.

(14) Rock in the low end of this band by adjusting the **B** band oscillator series trimmer marked **OSC-B-S** to a peak, then readjusting the signal generator frequency slightly; if the pointers rise

further giving a higher peak, leave the signal generator here and readjust OSC-B-S seeking a still higher peak. Repeat the processes back and forth readjusting first the generator and then the receiver OSC-B-S trimmer until an absolute peak is reached by this rocking process.

(15) Re-peak the high end of the band (3000 KC exactly as before).

(16) If any readjustment was made at the high end, again re-peak the low end. Continue this process of peaking and re-peaking high and low ends of the band until no appreciable readjustments are required at either end of the band.

c. The tracking of A band follows the identical processes followed above with the exception that the high end of the band is 2000 KC and the low end of the band is 1000 KC.

d. In tracking Radio Receiver BC-1003-A, bands A, B, C follow the same processes outlined in paragraph 26, for Radio Receiver BC-973-A, except that the frequencies used are as follows:

	<i>High</i>	<i>Low</i>
A band	200 KC	100 KC
B band	450 KC	200 KC
C band	1000 KC	450 KC

27. BEAT FREQUENCY OSCILLATOR.

a. Adjust the beat frequency oscillator on both Radio Receivers BC-973-A and BC-1003-A on B band at the middle of the band, 2500 KC for Radio Receiver BC-973-A and 325 KC for Radio Receiver BC-1003-A.

b. Remove the loop, handwheel, and top cover and replace the loop in the commutator to make the b-f-o adjusting trimmer accessible. Tune the signal generator to the frequency which gives maximum meter indicator. Throw the CW-OSC-Off switch to CW-OSC.

c. Detune the receiver until the pointer indication is decreased to 1/3 of maximum deflection. Adjust the b-f-o trimmer until zero beat is obtained.

d. Rotate the frequency dial of the receiver to the point giving maximum deflection of the indicator and check the audible note obtained which should be approximately 1,000 cycles.

28. SPECIAL PRECAUTIONS.

Several important points necessary to the proper operation of Radio Receiver BC-973-A and Radio Receiver BC-1003-A should be thoroughly understood by the personnel maintaining the equipment.

a. The gain of the two i-f channels must be almost exactly the same because the PRESS TO BALANCE control is only capable of taking care of minor gain variations, therefore, match the tubes carefully. Also check to see if the gain in each channel remains equal at various settings of the SENSITIVITY control for some tubes will match at maximum sensitivity but not at lower sensitivity.

b. Since the two loops must be identical in order to determine an accurate azimuth, exercise extreme care in making repairs on them. Be sure that the bolts, which fasten the lower outer loop shield to the upper outer loop shield, do not short the shields together. These bolts are insulated by means of bakelite bushings. If the loop is opened for any reason, be sure to close it and seal with glyptal which will prevent any moisture from entering.

c. The loop loading coils of Radio Receiver BC-973-A must be exact duplicates. In Radio Receiver BC-1003-A, loop loading coils must also be identical. If a broken wire is found in any of these coils, replace the defective coil rather than attempt to repair it.

d. In general, it is desirable to replace a defective loop instead of attempting to repair it, unless the equipment is available for the exact matching of the two loops, both as to inductance and Q. If any of the loop loading coils become defective, it is preferable to replace the pair of them with a matched pair rather than one only. Obviously, replacing either the loop or the loop loading coils will necessitate the oscillator tracking process to be repeated. This also applies to replacing a tuning capacitor.

SECTION V SUPPLEMENTARY DATA

29. TABLE OF REPLACEABLE PARTS.

NOTE: Order replacement parts by stock number, name, and description. The numbering used for distinguishing the parts in the various component units is as follows:

- a. Ref. Nos. 1 to 199—Radio Receiver BC-973-A (2 band).
- b. Ref. Nos. 200 to 249—Dynamotor power supply (used in both receivers).
- c. Ref. Nos. 250 to 299—Control Unit RM-35-A (used in both receivers).
- d. Ref. Nos. 300 to 399—Miscellaneous parts used in both receivers.
- e. Ref. Nos. 400 to end—Radio Receiver BC-1003-A (3 band).

a. Radio Receiver BC-973-A (2 band).

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
1		RESISTOR: variable; wirewound, 1500 ohm, 2 watt; V-taper, $1\frac{1}{8}$ " diam. x $\frac{3}{4}$ " deep, body dimensions: $\frac{3}{8}$ "— $32 \times \frac{1}{4}$ " bushing, 0.248 " x $\frac{3}{8}$ " shaft; insulated contact arm.	Radio gain or sensitivity control.	CL P58W	
2a		RESISTOR: variable; wirewound, 20,000 ohm, 2 watt, U-taper, $1\frac{1}{8}$ " diam. x $\frac{3}{4}$ " deep, body dimensions: $\frac{3}{8}$ "— $32 \times \frac{1}{16}$ " shaft, $\frac{3}{8}$ "— $32 \times \frac{1}{2}$ " insulated contact arm, in "dual control" with variable resistor ref. No. 2b and switch ref. No. 3.	Volume (audio gain) control.	CL	A676-C
2b		RESISTOR: variable; wirewound, 60,000 ohm, 2 watt; linear taper, $1\frac{1}{8}$ " diam. x $\frac{3}{4}$ " deep, body dimensions: $\frac{3}{8}$ "— $32 \times \frac{1}{4}$ " bushing, 0.248 " x $\frac{3}{8}$ " shaft insulated contact arm, in "dual control" with variable resistor ref. No. 2a and switch ref. No. 3.	Balance output circuits.	CL	A676-C

a. Radio Receiver BC-973-A (2 band) (Cont'd)

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
3		SWITCH: SPST, push type, special, contained in "dual control" with variable resistors ref. No. 2a and 2b.	Switches-in balance control variable resistor ref. No. 2b.	RN	B241
5		RESISTOR: fixed; carbon composition element, ceramic coating; 50 ohm $\pm 5\%$ 1 watt, $\frac{3}{4}$ " x $\frac{1}{4}$ ", axial leads.	Voltage dropping for control unit microphone supply.	ER 518	
6-1		RESISTOR: fixed; carbon composition element, ceramic coating; 300 ohm $\pm 5\%$, $\frac{1}{2}$ watt, $\frac{1}{16}$ " x $\frac{3}{16}$ ", axial leads.	Cathode bias 1st i-f amp, left.	ER 504	
6-2		Same as ref. No. 6-1	Cathode bias 1st i-f amp, right.	ER 504	
6-3		RESISTOR: fixed; carbon composition element, ceramic coating; 300 ohm, $\pm 5\%$, $\frac{1}{2}$ watt, $\frac{1}{16}$ " x $\frac{3}{16}$ ", axial leads.	Cathode bias 2d i-f amp, left.	ER 504	
6-4		Same as 6-3	Cathode bias 2d i-f amp, right.	do.	
7-1		RESISTOR: fixed; carbon composition element, ceramic coating; 500 ohm $\pm 5\%$, $\frac{1}{2}$ watt, $\frac{1}{16}$ " axial leads.	Cathode bias detector mixer, left.	do.	
7-2		Same as 7-1	Cathode bias detector mixer, right.	do.	
8		RESISTOR: fixed; carbon composition element, ceramic coating; 1,000 ohm $\pm 5\%$, 1 watt, $\frac{3}{4}$ " x $\frac{1}{4}$ " axial leads.	Cathode bias of audio amp.	ER 518	
9-1		RESISTOR: fixed; carbon composition element, ceramic coating; 2,000 ohm $\pm 5\%$, $\frac{1}{2}$ watt, $\frac{1}{16}$ " x $\frac{3}{16}$ " axial leads.	Plate decoupling resistor, detector mixer, left.	ER 504	

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
9-2		Same as 9-1	Plate decoupling resistor, detector mixer, right.	do.	
9-3		Same as 9-1	Plate decoupling resistor, 1st i-f amp, left.	do.	
9-4		Same as 9-1	Plate decoupling resistor, 1st i-f amp, right.	do.	
9-5		Same as 9-1	Plate decoupling resistor, 2d i-f, left.	do.	
9-6		Same as 9-1	Plate decoupling resistor, 2d i-f, right.	do.	
10-1		Same as 9-1, except 5,000 ohm	Reduce sense voltage.	do.	
11		RESISTOR: fixed; carbon composition element, ceramic coating; 20,000 ohm $\pm 5\%$, 1 watt, $\frac{3}{4}$ " x $\frac{1}{4}$ ", axial leads.	Plate dropping resistor of h-f oscillator.	ER 518	
12-1		RESISTOR: fixed; carbon composition element, ceramic coating; 35,000 ohm $\pm 5\%$, $\frac{1}{2}$ watt, $\frac{7}{16}$ " x $\frac{3}{16}$ ", acial leads.	Grid leak of left detector mixer injector grid.	ER 504	
12-2		Same as 12-1	Grid leak of right detector mixer injector grid.	do.	
12-3		Same as 12-1	Screen dropping resistor, 1st i-f amp, left.	do.	
12-4		Same as 12-1	Screen dropping resistor, 1st i-f amp, right.	do.	
12-5		Same as 12-1	Screen dropping resistor, 2d i-f amp, left.	do.	
12-6		Same as 12-1	Screen dropping resistor, 2d i-f amp, right.	do.	

a. Radio Receiver BC-973-A (2 band) (Cont'd)

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
3		SWITCH: SPST, push type, special, contained in "dual control" with variable resistors ref. No. 2a and 2b.	Switches-in balance control variable resistor ref. No. 2b.	RN	B241
5		RESISTOR: fixed; carbon composition element, ceramic coating; 50 ohm $\pm 5\%$ 1 watt, $\frac{3}{4}$ " x $\frac{1}{4}$ ", axial leads.	Voltage dropping for control unit microphone supply.	ER 518	
6-1		RESISTOR: fixed; carbon composition element, ceramic coating; 300 ohm $\pm 5\%$, $\frac{1}{2}$ watt, $\frac{7}{16}$ " x $\frac{3}{16}$ ", axial leads.	Cathode bias 1st i-f amp, left.	ER 504	
6-2		Same as ref. No. 6-1	Cathode bias 1st i-f amp, right.	ER 504	
6-3		RESISTOR: fixed; carbon composition element, ceramic coating; 300 ohm, $\pm 5\%$, $\frac{1}{2}$ watt, $\frac{7}{16}$ " x $\frac{3}{16}$ ", axial leads.	Cathode bias 2d i-f amp, left.	ER 504	
6-4		Same as 6-3	Cathode bias 2d i-f amp, right.	do.	
7-1		RESISTOR: fixed; carbon composition element, ceramic coating; 500 ohm $\pm 5\%$, $\frac{1}{2}$ watt, $\frac{7}{16}$ " axial leads.	Cathode bias detector mixer, left.	do.	
7-2		Same as 7-1	Cathode bias detector mixer, right.	do.	
8		RESISTOR: fixed; carbon composition element, ceramic coating; 1,000 ohm $\pm 5\%$, 1 watt, $\frac{3}{4}$ " x $\frac{1}{4}$ " axial leads.	Cathode bias of audio amp.	ER 518	
9-1		RESISTOR: fixed; carbon composition element, ceramic coating; 2,000 ohm $\pm 5\%$, $\frac{1}{2}$ watt, $\frac{7}{16}$ " x $\frac{3}{16}$ " axial leads.	Plate decoupling resistor, detector mixer, left.	ER 504	

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
9-2		Same as 9-1	Plate decoupling resistor, detector mixer, right.	do.	
9-3		Same as 9-1	Plate decoupling resistor, 1st i-f amp, left.	do.	
9-4		Same as 9-1	Plate decoupling resistor, 1st i-f amp, right.	do.	
9-5		Same as 9-1	Plate decoupling resistor, 2d i-f, left.	do.	
9-6		Same as 9-1	Plate decoupling resistor, 2d i-f, right.	do.	
10-1		Same as 9-1, except 5,000 ohm.	Reduce sense voltage.	do.	
11		RESISTOR: fixed; carbon composition element, ceramic coating; 20,000 ohm $\pm 5\%$, 1 watt, $\frac{3}{4}$ " x $\frac{1}{4}$ ", axial leads.	Plate dropping resistor of h-f oscillator.	ER 518	
12-1		RESISTOR: fixed; carbon composition element, ceramic coating; 35,000 ohm $\pm 5\%$, $\frac{1}{2}$ watt, $\frac{7}{16}$ " x $\frac{3}{16}$ ", axial leads.	Grid leak of left detector mixer injector grid.	ER 504	
12-2		Same as 12-1	Grid leak of right detector mixer injector grid.	do.	
12-3		Same as 12-1	Screen dropping resistor, 1st i-f amp, left.	do.	
12-4		Same as 12-1	Screen dropping resistor, 1st i-f amp, right.	do.	
12-5		Same as 12-1	Screen dropping resistor, 2d i-f amp, left.	do.	
12-6		Same as 12-1	Screen dropping resistor, 2d i-f amp, right.	do.	

a. Radio Receiver BC-973-A (2 band) (Cont'd)

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
13-1		Same as 12-1, except 50,000 ohm	Screen bleeder detector mixer, right.	ER 504	
13-2		Same as 12-1, except 50,000 ohm	Screen bleeder detector mixer, left.	do.	
13-3		Same as 12-1, except 50,000 ohm	Screen bleeder, 1st i-f, left.	do.	
13-4		Same as 12-1, except 50,000 ohm	Screen bleeder, 1st i-f, right.	do.	
13-5		Same as 12-1, except 50,000 ohm	Screen bleeder, 2d i-f, left.	do.	
13-6		Same as 12-1, except 50,000 ohm	Screen bleeder, 2d i-f, right.	do.	
13-7		Same as 12-1, except 50,000 ohm	Grid leak, h-f oscillator.	do.	
13-9		Same as 12-1, except 50,000 ohm	B-f-o grid leak.	ER 504	
13-10		Same as 12-1, except 50,000 ohm	Drops screen voltage detector-mixer, right.	do.	
13-11		Same as 12-1, except 50,000 ohm	Drops screen voltage detector-mixer, left.	do.	
13-12		Same as 12-1, except 50,000 ohm	Bleeder, right movement, meter circuit.	do.	
13-13		Same as 12-1, except 50,000 ohm	Bleeder, left movement, meter circuit.	do.	
14-1		Same as 12-1, except 75,000 ohm	Plate filter, 2d detector, left.	ER 504	
14-2		Same as 12-1, except 75,000 ohm	Plate filter, 2d detector, right.	do.	

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
14-3		Same as 12-1, except 75,000 ohm	Plate filter, 2d detector.	do.	
14-4		Same as 12-1, except 75,000 ohm	Plate filter, 2d detector.	do.	
15-3		Same as 12-1, except 100,000 ohm	Grid decoupling, 1st i-f amp, left.	do.	
15-4		Same as 12-1, except 100,000 ohm	Grid decoupling, 1st i-f amp, right.	do.	
15-5		Same as 12-1, except 100,000 ohm	Grid decoupling, 2nd i-f amp, left.	do.	
15-6		Same as 12-1, except 100,000 ohm	Grid decoupling, 2d i-f amp, right.	do.	
16-1		Same as 12-1, except 150,000 ohm	Drops plate voltage (b-f-o).	do.	
16-2		Same as 12-1, except 150,000 ohm	Drops A-v-c voltage.	do.	
17-1		Same as 12-1, except 500,000 ohm	Grid leak, 2d detector, left.	do.	
17-2		Same as 12-1, except 500,000 ohm	Grid leak, 2d detector, right.	do.	
17-3		Same as 12-1, except 500,000 ohm	Grid leak audio amp.	do.	
17-4		Same as 12-1, except 500,000 ohm	Drops screen voltage, 2d detector, left and right.	ER 504	
18-1		Same as 12-1, except 1 megohm	A-v-c diode load, 2d detector, left.	do.	
18-2		Same as 12-1, except 1 megohm	A-v-c diode load, 2d detector, right.	do.	
18-3		Same as 12-1, except 1 megohm	Drops r-f input to grid of 2d detector, left.	do.	
18-4		Same as 12-1, except 1 megohm	Drops r-f input to grid of 2d detector, right.	do.	

a. Radio Receiver BC-973-A (2 band) (Cont'd)

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
18-5		Same as 12-1, except 1 megohm	Series A-v-c filter, 2d detector, left.	do.	
18-6		Same as 12-1, except 1 megohm	Series a-v-c filter, 2d detector, right.	do.	
18-8		Same as 12-1, except 1 megohm	Drops screen voltage (b-f-o)	do.	
19-a, b, c, d		CAPACITOR: variable; air, 600, 120, 400, 600 μ mf; 4 sections, 31, 7, 19, 31 plates per section; $3\frac{3}{16}$ " high x $1\frac{27}{32}$ " wide, $4\frac{23}{32}$ " long; mounting centers $4\frac{23}{32}$ " x $1\frac{1}{4}$ ", special.	Main tuning capacitor.	RN	AA201-A
20-1a, b		CAPACITOR: variable; air, 0.030" spacing; 15 μ mf; 2 sections on ceramic alsimag #35 base $1\frac{15}{16}$ " x $1\frac{3}{8}$ " x $\frac{1}{4}$ ".	Trimmer 1st i-f, left.	HA APC-D-15	A921
20-2a, b		Same as 20-1a, b	Trimmer 1st i-f, right.	do.	A921
20-3a, b		Same as 20-1a, b	Trimmer, 2d i-f, left.	do.	A921
20-4a, b		Same as 20-1a, b	Trimmer, 2d i-f, right.	do.	A921
21-1		CAPACITOR: variable; air, 0.030" spacing; 15 μ mf; 1 section on ceramic alsimag #35 base $1\frac{15}{16}$ " x $1\frac{3}{8}$ " x $\frac{1}{4}$ ".	Trimmer, left diode.	HA	A918
21-2		Same as 21-1	Trimmer, right diode.	do.	A918
21-3		Same as 21-1	Parallel trimmer (b-f-o).	do.	A918
22-1		CAPACITOR: variable; air, 0.030" spacing; 15 μ mf; 1 section 8 plates per section, isolantite base, $1\frac{1}{2}$ " high x $1\frac{15}{16}$ " wide x $\frac{3}{4}$ " long; $\frac{1}{4}$ " diam. x $1\frac{1}{16}$ " long shaft; mounting centers $\frac{21}{32}$ ".	Parallel trimmer, A-band, h-f osc.	HA APC15	AA303
22-2		Same as 22-1	Parallel trimmer, B-band, h-f osc.	do.	AA303

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
23-1		CAPACITOR: variable; air, 0.030" spacing; 35 μ f. 1 section, 18 plates per section isolantite base $1\frac{1}{32}$ " high x $1\frac{1}{16}$ " wide x $\frac{3}{4}$ " long; $\frac{1}{4}$ " diam. x $1\frac{1}{16}$ " long shaft; mounting centers $2\frac{1}{32}$ ". Same as 23-1.	Loop trimmer, B-band, left.	HA APC35	AA303
23-2		Same as 23-1.	Loop trimmer, B-band, right.	HA APC35	AA303
23-3		Same as 23-1.	Loop trimmer, A-band, left.	do.	AA303
23-4		Same as 23-1.	Loop trimmer, A-band, right.	do.	AA303
24-1		CAPACITOR: variable; air, 0.017" spacing; 5.5-100 μ f; 1 section, 28 plates per section; isolantite base $1\frac{1}{32}$ " high x $1\frac{1}{16}$ " wide x $1\frac{1}{32}$ " long; $\frac{1}{4}$ " diam. x $1\frac{23}{32}$ " long shaft; mounting centers $2\frac{1}{32}$ ".	Series trimmer, A-band, h-f osc.	AS	AA303
25		CAPACITOR: fixed; 40 μ f $\pm$ 2%, 500-volt DC; silver mica, low-loss bakelite case $1\frac{1}{16}$ " x $\frac{1}{16}$ " x $\frac{3}{16}$ ", #20 axial leads $1\frac{1}{2}$ " long.	B-f-o oscillatory circuit.	CD 5R	
26-1		Same as 25, except 50 μ f.	Couples h-f osc. to injector grid, left.	do.	
26-2		Same as 25, except 50 μ f.	Couples h-f osc. to injector grid, right.	do.	
27-1		Same as 25, except 75 μ f.	Diode transformer, left plate tuning.	do.	
27-2		Same as 25, except 75 μ f.	Diode transformer, right plate tuning.	do.	

a. Radio Receiver BC-973-A (2 band) (Cont'd)

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
28-1		CAPACITOR: fixed; 100 μf $\pm$ 10%, 500-volt DC; foil plates XM262, low-loss bakelite case $1\frac{1}{16}$ " x $\frac{7}{16}$ " x $\frac{3}{16}$ ", 0.032" axial wire leads $1\frac{5}{16}$ " long. Same as 28-1	Couples r-f, blocks audio from 2d detector grid, left.	MI	
28-2			Couples r-f, blocks audio from 2d detector grid, right.	OXM	
28-3		Same as 28-1	R-f filter by-pass, 2d detector plate, left.	do.	
28-4		Same as 28-1	R-f filter by-pass, 2d detector plate, right.	do.	
29-1		CAPACITOR: fixed; 90 μf $\pm$ 2%, 500-volt DC, silver mica, low-loss bakelite case $1\frac{1}{16}$ " x $\frac{7}{16}$ " x $\frac{3}{16}$ " #20 axial leads $1\frac{1}{2}$ " long. Same as 29-1	Loop tuning, A-band, left	CD 5R	
29-2			Loop tuning, A-band, right.	do.	
30		Same as 29-1, except 150 μf	Parallel tuning, B-band, h-f osc.	do.	
31-1		Same as 29-1, except 190 μf	Tunes 1st i-f plate, left.	do.	
31-2		Same as 29-1, except 190 μf	Tunes 1st i-f plate, right.	do.	
31-3		Same as 29-1, except 190 μf	Tunes 2d i-f grid, left.	do.	
31-4		Same as 29-1, except 190 μf	Tunes 2d i-f grid, right.	do.	
31-5		Same as 29-1, except 190 μf	Tunes 2d i-f plate, left.	do.	
31-6		Same as 29-1, except 190 μf	Tunes 2d i-f plate, right.	do.	
31-7		Same as 29-1, except 190 μf	Tunes 3d i-f grid, left.	do.	
31-8		Same as 29-1, except 190 μf	Tunes 3d i-f grid, right.	do.	
32		Same as 28-1, except 250 μf	Crid coupling b-f-o.	MI OXM	

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
33-1		Same as 25, except 280 μ f.	Loop tuning, B-band, left.	CD	
33-2		Same as 25, except 280 μ f.	Loop tuning, B-band, right.	5R do.	
34		CAPACITOR: fixed; 800 μ f $\pm$ 5%, 500-volt DC; silver mica, low-loss bakelite case $\frac{3}{4}$ " x $\frac{3}{4}$ " x $\frac{1}{4}$ ", #18 axial wire leads.	Fixed padder, A-band, h-f osc.	CD 1R	
35a, b		CAPACITOR: fixed; 2,640 μ f; same type as ref. No. 34; made up of 35a (190 μ f) and 35b (2,450 μ f), may vary $\pm$ 500 μ f in individual sets.	Fixed padder, B-band, h-f osc.	do.	
36-1		CAPACITOR: fixed; 0.002 μ f $\pm$ 10%, 500-volt DC, foil plates, M262 low-loss bakelite case $\frac{13}{16}$ " x $\frac{13}{16}$ " x $\frac{9}{16}$ ", 0.040" diam. axial wire leads.	By-pass, meter diode, 2d detector, left.	MI W	
36-2		Same as 36-1.	By-pass, meter diode, 2d detector, right.	do.	
36-3		Same as 36-1.	Plate filter, 2d detector, left.	do.	
36-4		Same as 36-1.	Plate filter, 2d detector, right.	do.	
36-5		CAPACITOR: fixed; 0.002 μ f $\pm$ 10%, 500-volt DC; foil plates, brown bakelite case $\frac{19}{16}$ " x $\frac{5}{8}$ " x $\frac{1}{4}$ "; 0.144" diam. mounting holes, $\frac{1}{4}$ " apart; lug leads with 0.157" diam. hole.	Couples h-f osc. tube plate to h-f osc. circuit.	MI E .	
36-6		Same as 36-1.	By-pass audio plate.	do.	

a. Radio Receiver BC-973-A (2 band) (Cont'd)

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
37-1		CAPACITOR: fixed; $0.01 \mu f \pm 10\%$, 300-volt DC; foil plates, brown bakelite case $1" \times \frac{5}{8}" \times \frac{11}{32}"$, lug leads with 0.157" diam. hole spaced $1\frac{5}{8}"$ center to center.	Filter, a-v-c diode, detector, left.	MI T	
37-2		Same as 37-1	Filter a-v-c diode, detector, right.	do.	
37-3		Same as 37-1	By-pass, screen, b-f-o.	do.	
37-4		Same as 37-1	By-pass, a-v-c, left.	do.	
37-5		Same as 37-1	By-pass, a-v-c, right.	do.	
38-1		CAPACITOR: fixed; $0.1 \mu f \pm 20\%$, 400-volt DC, molded paper $1\frac{1}{16}" \times \frac{3}{4}" \times \frac{3}{8}"$, #20 axial leads $1\frac{1}{2}"$ long.	Meter by-pass, left.	MI 345-21	
38-2		Same as 38-1	Meter by-pass, right.	do.	
38-3		Same as 38-1	Audio amplifier grid coupling.	MI	
38-4		Same as 38-1	Plate coupling b-f-o or VT162 screen by-pass.	do.	
38-5		Same as 38-1	Sensitivity control by-pass.	do.	
39-1a		CAPACITOR: fixed; 2 sections each, $0.1 \mu f \pm 10\%$, 400-volt DC; aluminum foil $1\frac{13}{16}" \times 1" \times \frac{3}{4}"$; lug leads, mounting centers $2\frac{1}{8}"$.	By-pass, mixer cathode, left.	CD HC1521-A	A907A A907A
39-1b		Same as 39-1a	By-pass, mixer screen, left.	do.	A907A
39-2a		Same as 39-1a	By-pass, mixer cathode, right.	do.	A907A

Supplementary Data

**TM 11-246A
Par. 29**

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
39-2b		Same as 39-1a	By-pass, mixer screen, right.	do.	A907A
39-3a		Same as 39-1a	By-pass, mixer plate, left.	HC1521-A	A907A
39-3b		Same as 39-1a	By-pass, 1st i-f grid, left.	do.	A907A
39-4a		Same as 39-1a	By-pass, mixer plate, right.	do.	A907A
39-4b		Same as 39-1a	By-pass, 1st i-f grid, right.	do.	A907A
39-5a		Same as 39-1a	By-pass, 1st i-f cathode, left.	CD	A907A
39-5b		Same as 39-1a	By-pass, 1st i-f screen, left.	do.	A907A
39-6a		Same as 39-1a	By-pass, 1st i-f cathode, right.	do.	A907A
39-6b		Same as 39-1a	By-pass, 1st i-f screen, right.	do.	A907A
39-7a		Same as 39-1a	By-pass, 1st i-f plate, left.	do.	A907A
39-7b		Same as 39-1a	By-pass, 2d i-f grid, left.	do.	A907A
39-8a		Same as 39-1a	By-pass, 1st i-f plate, right.	do.	A907A
39-8b		Same as 39-1a	By-pass, 2d i-f grid, right.	do.	A907A
39-9a		Same as 39-1a	By-pass, 2d i-f cathode, left.	do.	A907A
39-9b		Same as 39-1a	By-pass, 2d i-f screen, left.	do.	A907A
39-10a		Same as 39-1a	By-pass, 2d i-f cathode, right.	do.	A907A

a. Radio Receiver BC-973-A (2 band) (Cont'd)

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
39-10b		Same as 39-1a	By-pass, 2d i-f screen, right.	do.	A907A
40-1		CAPACITOR: fixed; $0.5 \mu f \pm 10\%$, 400-volt DC; aluminum foil, metal case $1\frac{13}{16}" \times 1\frac{15}{16}" \times \frac{3}{4}"$, lug leads mounting centers $2\frac{1}{8}"$.	By-pass, 2d i-f plate, left.	CD HC2126	A908 A908
40-2		Same as 40-1	By-pass, 2di-f plate, right.	do.	A908
40-3		Same as 40-1	By-pass, B+ bus.	do.	A908
40-4		Same as 40-1	Decoupling of 2d detector plate.	do.	A908
40-5		Same as 40-1	By-pass, A+ bus.	do.	A908
41-1		CAPACITOR: fixed; $25 \mu f$, 25-volt DC; electrolytic, aluminum can, $\frac{5}{8}"$ diam. $\times 1\frac{1}{16}"$ long, #18 axial leads, $3"$ long.	By-pass, sense relay.	CD BR252A	
41-2		Same as 41-1	By-pass, balance switch.	do.	
41-3		Same as 41-1	Cathode by-pass, audio amp.	do.	
42-1		CAPACITOR: fixed; $500 \mu f$, $+75\%$, -0% , 6-volt DC; metal case, electrolytic $1\frac{13}{16}" \times 1" \times \frac{7}{8}"$, lug leads, mounting centers $2\frac{1}{8}"$.	Meter damping, right movement.	CD AVL10142	A909
42-2		Same as 42-1	Meter damping, left movement.	do.	A909
43		AMMETER: DC, 0-100 microamps, 2% accuracy; 2 D'Arsonval movements; flange $\frac{3}{4}"$ diam., body $\frac{3}{4}"$ diam. $\times 2.29"$ deep, 4 holes for #6 screws at corners of a $2.474"$ square; molded front frame olive drab; face calibrated in 10° , 20° , 30° , 40° , either side of center, orange pointers and orange 0° line.	Direction indicator.	WE 635-52	AA309

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
44		TRANSFORMER: audio primary to match VT134 tube, secondary 4,000 ohms tapped at 250 ohms, mounted terminals down, 4 inserts 4-40 tap, $\frac{7}{8}$ " centers, terminal lugs $1\frac{1}{8}$ " x $1\frac{1}{16}$ " x $1\frac{15}{16}$ ". COIL: i-f, 458 kc; 0.55 millihenries, 6 μ f distributed capacity; litz wire, universal winding; wax impregnated wound on iron core $\frac{3}{8}$ " I.D., $\frac{3}{8}$ " O.D., $\frac{1}{2}$ " long, DC resistance 4 ohms; coil Q-220. Same as 45-1.	Audio output.	UN 72860	A706A
45-1		Same as 45-1.	I-f amplifier transformer, left channel, 1st stage.	SI 11394	
45-2		Same as 45-1.	I-f amplifier transformer, right channel, 1st stage.	do.	
46-1		Same as 45-1.	I-f amplifier transformer, left channel, 2d stage.	do.	
46-2		Same as 45-1.	I-f amplifier transformer, right channel, 2d stage.	do.	
47-1		COIL: i-f, 458 kc diode; three separate universal windings, tightly coupled, windings wound on bakelite form $\frac{1}{2}$ " diam., 2" long, wax impregnated litz wire, standard lug terminals, DC resistance 14 ohms per winding, coil Q-55. Windings: secondary, 1.15 millihenries; primary, 1.15 millihenries; tertiary, 1.25 millihenries.	Left channel diode transformer.	SI 11346B	
47-2		COIL: i-f 458 kc diode; three separate universal windings, tightly coupled windings wound on bakelite form $\frac{1}{2}$ " diam., 2" long, wax impregnated litz wire, standard lug terminals, DC resistance 14 ohms per winding, coil Q-55.	Right channel diode transformer.	SI 11346A	

a. Radio Receiver BC-973-A (2 band) (Cont'd)

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
48		Windings: secondary, 1.15 millihenries; primary, 1.15 millihenries; tertiary, 1.25 millihenries. COIL: r-f sense; 0.077 millihenries, distributed capacity 13 μ f; universal winding, litz wire, wound on iron core $\frac{3}{8}$ " diam. x $\frac{1}{2}$ " long; assembled on ceramic mounting base, 6-32 mounting hole.	B-band sense transformer.	SI 12663	
49		COIL: r-f sense; 0.055 millihenries, distributed capacity 11 μ f; universal winding, litz wire, wound on iron core $\frac{3}{8}$ " diam. x $\frac{1}{2}$ " long; assembled on ceramic mounting base, single 6-32 mounting hole.	A-band sense transformer.	SI 12662	
50		SLIP RINGS: hard fine silver; inlays $\frac{3}{16}$ " wide x $3\frac{7}{8}$ " long x 0.031" thick, XXXP natural bakelite tubing $1\frac{1}{4}$ " O.D. x $\frac{7}{8}$ " I.D.; silver inlay joints butted.	Loop slip rings.	RI	B227-H
51-1		ANTENNA LOOP: right channel; 4 turns #18 solid enamel wire, wound on slotted bakelite insulated blocks; 7 microhenries, 25 μ f distributed capacity; Q 110 at 2 mc; DC resistance 0.25 ohms.	Antenna voltage pickup.	do.	
51-2		ANTENNA LOOP: left channel; 4 turns #18 solid enamel wire, wound on slotted bakelite insulated blocks; 7 microhenries, 25 μ f distributed capacity; Q 110 at mc, DC resistance 0.25 ohms.	do.	do.	
52-1		COIL: r-f; 0.019 millihenries, without can, distributed capacity 4.66 μ f; universal winding, litz wire, wound on powdered iron core $\frac{3}{8}$ " diam. x $\frac{1}{2}$ " long, assembled on ceramic base, coil mounted in aluminum can $1\frac{3}{8}$ " x $1\frac{3}{8}$ " x $3\frac{1}{8}$ " long, matched with 52-2.	Loop series loading coil, left channel.	SI 12667	

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
52-2		Same as 52-1, matched with 52-1.....	Loop series loading coil, right channel.	SI 12667	
53		COIL: r-f, osc.; 0.02 millihenries (entire coil), distributed capacity 10 μf ; universal winding, solid cotton covered wire, wound on bakelite form $\frac{1}{2}$ " diam. x 1" long, with screw type powdered iron core adjustment, wax impregnated.	A-band h-f osc. coil.	ES A-188	
54		COIL: r-f; 0.016 millihenries (entire coil), distributed capacity 10 μf ; universal winding, solid cotton covered wire, wound on bakelite form $\frac{1}{2}$ " diam. x 1" long, with screw type powdered iron core adjustment, wax impregnated.	B-band h-f osc. coil.	ES A-189	
55		COIL: b-f-o; 1.8 millihenries (entire coil), distributed capacity 5.66 μf , 2 universal pie windings tied together, litz wire, wax impregnated, wound on bakelite tubing $\frac{1}{2}$ " diam. x $2\frac{1}{8}$ " long, pigtail leads.	Reception of c-w signals.	SI 12660	
56-1		JACK: JK-34-A, phone, single open circuit, fits in $\frac{3}{8}$ " mounting hole, $1\frac{1}{4}$ " overall length.	Receptacle for headset plug or patch cord plug.		
56-2		Same as 56-1.....	Receptacle for patch cord plug.		
57		RECEPTACLE: special 5 pin socket, bakelite insulation.	Connects loop antenna to loop slip rings.	RN	A713-C
58		PLUG, special 5 prong plug, bakelite insulation.....	Connects loop slip rings to loop antenna.	do.	A758-C

a. Radio Receiver BC-973-A (2 band) (Cont'd)

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
59		PLUG: 4 pin, standard insulation, conduit thread $\frac{3}{4}$ -20, thread length $\frac{3}{8}$ ", mounting holes $\frac{29}{32}$ ", 0.120 diam.	Connects meter to meter receptacle in chassis.	CA AN-3106 14S-2F	A814
60		RECEPTACLE: 4 pin, standard insulation, 4 pins are cut down from 1" to $\frac{7}{8}$ " overall, receptacle mounts in meter casting $\frac{3}{4}$ " diam., $1\frac{1}{32}$ " deep.	Receptacle for direction indicator meter.	CA AN-3106 14S-2P	
61		RECEPTACLE: 4 banana pins, bakelite insulation mounts in $1\frac{3}{4}$ " diam. hole, $\frac{3}{4}$ " deep, 4 mounting holes $1\frac{3}{4}$ " apart.	Connects power cable to receiver.	UL SO-69	
62-1		SWITCH: SPST; toggle, rear leg type; 3 amp, 250 volts; bakelite case, bushing length $1\frac{5}{32}$ " mounts in $\frac{1}{2}$ " hole, bat handle.	Light switch.	CH 8280	AA257-A
62-2		Same as 62-1.....	C-w osc on and off switch.	do.	
62-3		Same as 62-1.....	A-v-c on and off switch.	do.	
63		SWITCH: SPST; push button, 3 amps, 125 volts; bakelite case, bushing length $1\frac{5}{32}$ " mounts in $\frac{1}{2}$ " hole.	Mounting sense indication.	GE GA19A1	AA257-A
64-1		SWITCH: DPST; toggle, rear lug type; 3 amps, 250 volts; bakelite case, bushing length $1\frac{5}{32}$ " mounts in $\frac{1}{2}$ " hole.	Power switch on and off.	CH 8360	
64-2		Same as 64-1.....	Meter damp on and off.	do.	
65-a, b, c, d		SWITCH: 4-gang, rotary selector, 3 pole (2 poles selector and one pole shorting type), ceramic wafers, $5\frac{5}{16}$ " long x $2\frac{1}{2}$ " x $2\frac{3}{4}$ ", $\frac{1}{4}$ " diam. shafts x $\frac{1}{2}$ " long, $\frac{3}{8}$ "—32 x 38" bushing.	Band selection.	RN	

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
66-1		RELAY: DPDT; coil, 4-volt DC, 16 ohms, 0.25 amps, 1 watt; contacts silver; mounting stud screw 6-32 x $\frac{1}{4}$ " long, relay dimension $1\frac{3}{4}$ " x $1\frac{3}{4}$ " x $1\frac{1}{4}$ ".	Balance circuitswitching	AE 1604X	
66-2		Same as 66-1.	do.	do.	
66-3		RELAY: DPDT, coil 4-volt DC, 16 ohms, 0.25 amps, 1 watt; contacts silver, mounting stud screw 6-32" x $\frac{5}{16}$ " long, relay dimensions $1\frac{3}{4}$ " x $1\frac{3}{4}$ " x $1\frac{1}{4}$ ".	Sense circuit switching.	do.	
67		RELAY: DPDT; coil, 12-volt DC, 150 ohms, 0.08 amps, 0.96 watts; contacts silver; mounting stud screw 6-32" x $\frac{1}{4}$ " long, relay dimensions $1\frac{3}{4}$ " x $1\frac{3}{4}$ " x $1\frac{1}{4}$ ".	B-f-o switch circuit.	AE 1604X	
68		ANTENNA: AN-45-E; telescopic type; Admiralty metal, chrome plated dull finish; $16\frac{1}{2}$ " when closed, 96" when extended; 7 sections, female thread in base $\frac{5}{16}$ "-18—US fine class 2 thread, $1\frac{1}{16}$ " depth of thread.	Sense antenna.	BC	
69-1		LAMP: incandescent, tungsten filament clear finish, miniature, screw base, 12-16 volt, 0.20 amp.	Pilot light.	GE 1487	
69-2		Same as 69-1.	do.	do.	
69-3		Same as 69-1.	do.	do.	
70-1		SOCKET: miniature screw base, fits in $\frac{1}{2}$ " mounting hole, held in place by special round locking spacer having inside diameter $\frac{1}{2}$ "—32, $\frac{3}{8}$ " high.	Front panel pilot light.	MA 330	
70-2		SOCKET: miniature screw base, specially altered to fit 90° gooseneck elbow.	Handwheel pilot light.	do.	A859-B

a. Radio Receiver BC-973-A (2 band) (Cont'd)

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
70-3		SOCKET: miniature screw base, fits in $\frac{1}{2}$ " mounting hole, held in place by special round locking spacer, having inside diameter $\frac{1}{2}$ "—32, $\frac{3}{8}$ " high.	Front panel pilot light.	do.	
71-1 through 71-11		SOCKET: steatite, octal, retainer ring type mounting, mounts in $1\frac{1}{4}$ " hole.	Tube sockets.		AP SS-8M
72-1		RESISTOR: fixed; carbon composition ceramic coating; 10,000 ohm $\pm 5\%$, $\frac{1}{2}$ watt; $\frac{1}{16}$ " x 0.215", #20 axial leads, $1\frac{1}{2}$ " long.	Drops meter voltage, left.	ER 504	
72-2		Same as 72-1.	Drops meter voltage, right.	do.	
74- or 5-2		RESISTOR: fixed; carbon composition, ceramic coating; 50 ohms $\pm 5\%$, $\frac{1}{2}$ watt; $\frac{1}{16}$ " x 0.215", #20 axial leads $1\frac{1}{2}$ " long.	Loop return resistor.	do.	
75		RESISTOR: fixed; carbon composition, ceramic coating; 50,000 ohm $\pm 5\%$, 1 watt; $\frac{3}{4}$ " x 0.282", #20 axial leads $1\frac{1}{2}$ " long.	Extends attenuation range of sensitivity control.	ER 518	
101-1		TRANSFORMER: i-f, 548 kc; aluminum shield can 4" x 2" x $1\frac{1}{2}$ "; contains parts ref. Nos. 20-1a, 20-1b, 31-1, 31-3, and 45-1.	1st i-f transformer, left.	RN	A989
101-2		TRANSFORMER: i-f, 458 kc; aluminum shield can 4" x 2" x $1\frac{1}{2}$ "; contains parts ref. Nos. 20-2a, 20-2b, 31-2, 31-4, and 45-2.	1st i-f transformer, right.	do.	A989
102-1		TRANSFORMER: i-f, 458 kc; aluminum shield can 4" x 2" x $1\frac{1}{2}$ "; contains parts ref. Nos. 20-3a, 20-3b, 31-5, 31-7, and 46-1.	2d i-f transformer, left.	do.	A990

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
102-2		TRANSFORMER: i-f, 458 kc; aluminum shield can 4" x 2" x 1½"; contains parts ref. Nos. 20-4a, 20-4b, 31-6, 31-8, and 46-2.	2d i-f transformer, right.	RN	A990
103-1		TRANSFORMER: i-f, 458 kc; aluminum shield can 4" x 2" x 1½"; contains parts ref. Nos. 21-1, 27-1, 47-1, 20-1, 18-3, 17-1, 18-1, 37-1, 18-5, 36-1, and 72-1.	3d i-f transformer and diode, left.	do.	A992
103-2		TRANSFORMER: i-f, 458 kc; aluminum shield can 4" x 2" x 1½"; contains parts ref. Nos. 21-2, 27-2, 47-2, 28-2, 18-4, 17-2, 18-2, 37-2, 36-2, 18-6, and 72-2.	3d i-f transformer and diode, right.	do.	A992
104		OSCILLATOR ASSEMBLY: parts mounted on ¾" thick bent aluminum bracket 2.44" x 2.3" x 4.0"; contains parts ref. Nos. 53, 24-1, 34, 22-1, 54, 24-2, 35, 30, and 22-2.	R-f heterodyne osc.	do.	B246 AA325
105		TRANSFORMER ASSEMBLY: in aluminum shield can 4" x 2" x 1½"; contains parts ref. Nos. 482, 421-3, 497, 432, and 413-9.	Beat frequency osc.	do.	A991
106		POTENTIOMETERS: dual control, special, 2-gang; assembled in aluminum frame; contains parts ref. Nos. 2a, 2b, and 3.	Balance control and audio gain.	do.	B257-A

a. Radio Receiver BC-973-A (2 band) (Cont'd)

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
107		LOOP ANTENNA LP-23-A: two loops at right angles to each other, aluminum loopshell consisting of 7 aluminum castings, bakelite saddle blocks made from XXXP natural bakelite, wax impregnated, 4 turns #18 solid enamel wire approximately 10 ft. long; turns spaced approximately $\frac{1}{8}$ " apart, single layer winding contains parts ref. Nos. 51-1, 51-2.	Loop antenna.	RI	C241-D
108		LOOP APPENDAGE: 5-wire coaxial line approx. 8" long, leads for loop #1 and loop #2 are shielded electrostatically from each other internally, 5 silver rings made from hard fine silver $\frac{3}{16}$ " x $3\frac{27}{32}$ " x 0.031" thick, inlaid in XXP bakelite, internal transmission leads made from hard fine silver bus bar $\frac{1}{16}$ " diam.; contains parts ref. Nos. 50 and 58.	Connects loop antenna to loop brush can.	do.	B227-1

b. Dynamotor Power Supply.

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
200		DYNAMOTOR PE-133-A, and filter box assembly, containing parts ref. Nos. 210, 209, 201-1, 201-2, 202-1, 207, 204, 206, 205, 202-2, 203, and 211.	Power supply.	RN	C242-A AA327
201-1		CAPACITOR: fixed; 0.002 μf $\pm$ 10%, 500-volt DC; low-loss molded bakelite, $1\frac{1}{16}$ " x $1\frac{1}{16}$ " x $\frac{9}{16}$ " thick, axial wire leads $1\frac{1}{4}$ " long.	Commutator hash filter (input low voltage).	MI W	
201-2		Same as 201-1.	Commutator hash filter (output high voltage).	MI W	
202-1		CAPACITOR: fixed; 0.5 μf , 400-volt DC; paper non-inductive, copper tinned case $1\frac{1}{16}$ " x $1\frac{1}{16}$ " x $\frac{3}{4}$ " thick, mounting lugs $2\frac{1}{4}$ " apart, lug terminals.	A + input by-pass.	CD HC-2126	
202-2		Same as 202-1.	High voltage B + by-pass.	do.	
203		CAPACITOR: fixed; 8 μf ; electrolytic 350-volt DC; copper tinned case 1 " x $1\frac{7}{8}$ " x $\frac{7}{8}$ " thick, mounting lugs $2\frac{3}{16}$ " apart, lug terminals.	B + by-pass.	CD AVL-10079	
204		CAPACITOR: fixed; 50 μf ; electrolytic 25-volt DC; aluminum shield can, $\frac{5}{8}$ " x $1\frac{1}{16}$ " mounting single clamp type lug, axial leads 3 " long.	A + input by-pass.	CD BR-502	
205		COIL: 4 henries, 75 milliamperes, iron core, pitch impregnated, housed in steel can $1\frac{3}{8}$ " x $1\frac{3}{8}$ " x $1\frac{7}{8}$ "; 2 terminal lugs $1\frac{7}{8}$ " mounting lugs.	Filter choke.	UN 58124	
206		COIL: 3 millihenries, 10 ohms, universal winding, wound on bakelite form 1 " long, $\frac{1}{2}$ " diam., wax impregnated, coil and form inserted in bakelite protective tubing 1 " long, 1 " diam. lug terminals, single #6-32 mounting hole.	R-f choke B + supply.	AW 400-131	

b. Dynamotor Power Supply (Cont'd)

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
207		COIL: 6 microhenries, approx. 25 ohm, 25 amps; special helical winding, coil inserted in bakelite tubing $1\frac{1}{16}$ " I.D. x $1\frac{1}{2}$ " long, wax impregnated, 2 lug terminals, single hole mount for #6-32 screw clearance.	A + r-f choke.	MA 583	
208-1		PLUG, PL-89.	Connects receiver to dynamotor cable.	UL PL-89	SC-D-1509
208-2		PLUG, PL-89.	Connects dynamotor to dynamotor cable.	do.	SC-D-1509
209		RECEPTACLE SO-69.	Dynamotor output receptacle.	UL SO-69	SC-D-1510
210-		DYNAMOTOR PE-133-A: input 12.2 volts, 3.3 amps, output 230 volts, 0.090 amps, 4,000 rpm continuous duty.	Dynamotor B+ source.	PI SP125	
211		RECEPTACLE: 2 contacts, male, bakelite insulation, 15 amps, 125 volt, $\frac{7}{8}$ " long x 1" diam. mounting centers $1\frac{3}{8}$ ".	Connects cable plug to dynamotor.	HU 7467	
212		PLUG: 2 contact, female, bakelite insulation, 15 amps, 125 volt, $1\frac{1}{16}$ " long x 1" diam. screw type terminals.	Battery cable plug.	HU 7467	
213		FUSES: cartridge, 15 amp, 25 volt, glass enclosed, non-renewable element, instantaneous, $1\frac{1}{4}$ " long x $\frac{1}{4}$ ".	Fuses A + battery leads.	LI 3AG 1082	
214		BATTERY: 6 cells, 12 volt, aeroplane type, 63 ampere hour, 67.5 lbs., $13\frac{7}{8}$ " x $7\frac{3}{16}$ " x $10\frac{3}{4}$ ", two carrying handles.	Dynamotor supply source.	EX 6XT13	

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
215		CABLE: flexible shielded rubber covered conduit, approx. $\frac{3}{8}$ " I.D., 2 coupling nuts $\frac{1}{16}$ "—24 thread, 10 ft. length, contains 4 wires, three #14 stranded fabric covered, one #18 stranded fabric covered. CONNECTOR: black #12 stranded wire, vinylite cotton braid finish, coated flame retarding lacquer, approx. length 10", battery lug soldered at one end, copper lead coated, $1\frac{3}{8}$ " long, $\frac{3}{8}$ " O.D. x $\frac{9}{32}$ " I.D. slot clearance $\frac{1}{32}$ ".	Cable between dynamo- tor and receiver.	BR CA-1 C-151-0375	
216-1		CONNECTOR: red #12 stranded wire, vinylite cotton braid finish, coated flame retarding lacquer, approx. length 30" battery lug soldered at one end, copper lead coated $1\frac{3}{8}$ " long, $\frac{3}{8}$ " O.D. x $\frac{9}{32}$ " I.D. slot clearance $\frac{1}{32}$ ".	A—wire between battery terminal and dynamo- tor plug.	RN	A504
216-2		CONNECTOR: red #12 stranded wire, vinylite cotton braid finish, coated flame retarding lacquer, approx. length 30" battery lug soldered at one end, copper lead coated $1\frac{3}{8}$ " long, $\frac{3}{8}$ " O.D. x $\frac{9}{32}$ " I.D. slot clearance $\frac{1}{32}$ ".	A+ wire between battery terminal and dynamo- tor plug.	do.	A504
217		BRUSHES: carbon; high voltage brushes $\frac{9}{32}$ x $\frac{3}{32}$ " thick, $\frac{1}{2}$ " long, with fine stranded wire lead 1" long, 2 per dynamotor; low voltage brushes $\frac{1}{2}$ " wide, $\frac{3}{16}$ " thick, $\frac{3}{4}$ " long, with fine stranded wire lead 1" long, 2 per dynamotor.		PI A-6782	
218		ARMATURE: containing 2 separate windings high and low voltage, 12 volts input, 230 volt output at 90 milliamps.	Armature in dynamotor.	PI	
219		BEARING: ball, single row annular, stainless steel 0.233" I.D., $\frac{3}{4}$ " O.D., $\frac{5}{16}$ " wide.	Supports generator arma- ture shaft at commu- tator ends.	PI ND C8036	

b. Dynamotor Power Supply (Cont'd)

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
220		FUSE RETAINER: steel cadmium plated, $\frac{1}{2}$ " diam., $2\frac{1}{2}$ " long, houses standard 3AG fuse $1\frac{1}{2}$ " x $\frac{1}{4}$ " diam.	Fuses A+ lead battery to dynamotor.	LI 1089-2A	
221		FUSE MOUNT: double pole, bakelite base, $1\frac{5}{8}$ " x 1" wide x $\frac{3}{16}$ " thick, 2 mounting holes $\frac{1}{8}$ " diam., $\frac{1}{2}$ " centers.	Spare fuse holder.	LI 39-31	

c. Control Unit RM-35-A

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
250		CONTROL UNIT, RM-35-A.....	Control box mixing receiver output and microphone to telephone line.	RN	C-252-E 5C-D-4990B
251		POTENTIOMETER, RS-247, 3-gang, wire wound, 1st section 500 ohms, 2d section 5,000 ohms, 3d section 500 ohms, no switch, 1 5/8" diam. x 1 15/16" deep body dimensions, 3/8" — 32 x 1/4" bushing, 1/4" x 3/8" shaft, insulated contact arm, called a T pad.	Constant impedance attenuator in Control Unit RM-35-A.	CL 42-3	
252		AUDIO TRANSFORMER: primary matched to tube VT134, secondary 4,000 ohm at 400 cycles, tapped at 250 ohm shielded case, pitch impregnated, case 1 3/8" x 1 3/8" x 1 7/8" high, 2 mounting holes 1 7/8" centers.	Audio transformer.	UN 72860	
253		TRANSFORMER: audio, primary 4,000 ohms at 400 cycles, 2 secondaries, 300 ohms at 400 cycles, and 600 ohms at 400 cycles, shielded case, pitch impregnated, case 1 3/8" x 1 3/8" x 1 7/8" high, 2 mounting holes 1 7/8" centers.	Audio transformer.	UN 72392	
254		SWITCH, SW130, DPST: toggle, rear lug type, 3 amp, 250 volt, bakelite case, bushing length 1/4", mounts in 1/2" hole.	Switching radio on telephone line.	CH 8363	
255		SWITCH, SW157, DPST, toggle, rear lug type, 3 amps, 250 volt, bakelite case, bushing length 1/4", mounts in 1/2" hole.	Switching from radio only to radio and phone.	CH 8360	

c. Control Unit RM-35-A (Cont'd)

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
256-1		JACK, JK-34-A	Receptacle for headset plug.	CT	
256-2		JACK, JK-34-A	Receptacle for mic. supply patch cord.	do.	
256-3		JACK, JK-34-A	Receptacle for phones.	do.	
256-4		JACK, J-259	Receptacle for phones.	do.	
256-5		JACK, JK-34-A	Receptacle for 600-ohm line plug.	do.	
256-6		JACK, JK-34-A	Receptacle for microphone plug.	do.	
257-1		COIL: r-f choke, 72 millihenries, universal winding, 10 μ mf distributed capacity, 180 ohm resistance, powdered iron core, $\frac{3}{8}$ " diam. x $\frac{1}{2}$ " long, mounting centers $\frac{7}{8}$ ". Same as 257-1	R-f telephone line filter Control Unit RM-35-A high side.	ES A106	
257-2			R-f telephone line filter Control Unit RM-35-A low side.	ES A106	

d. Miscellaneous Parts

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
301		AZIMUTH LOOP HANDWHEEL, M-333-A: seats in loop appendage flange, diagonal front surface, 360° scale engraved direct and reciprocal, outer assembly made from aluminum casting, 11" O.D., inner adjusting disc stainless steel, $\frac{3}{4}$ " thick, 8" O.D. x $3\frac{1}{4}$ " I.D.	Azimuth reading.	RN	B-229-E
303		CHEST: $\frac{3}{8}$ " fibre covered veneer, U. S. standard, $14\frac{3}{4}$ " x 16" x 22", two 4" carrying handles, special internal built-in compartments.	For transporting and housing receiver when not in use.	do.	B-254-H
304		CHEST: $\frac{3}{8}$ " fibre covered veneer, U. S. standard, $27\frac{1}{2}$ " x 9" x 22", two external 4" handles, internal horizontal shelf 8" x $26\frac{1}{2}$ " x $\frac{3}{8}$ " thick, with four sash bolts located in each corner, $2\frac{3}{4}$ " external dynamotor outlet with removable twist cover.	For housing following items: 12-volt battery, Dynamotor PE-133-A, Cord CD-673, sense antenna, tripod, and 2 spare fuses.	do.	B-255-K
305		CHEST: $\frac{3}{8}$ " fibre covered veneer, U. S. standard, $15\frac{3}{4}$ " x $8\frac{1}{2}$ " x $12\frac{1}{2}$ ", two external 4" handles.	Spare battery chest.	do.	AA-243-F
306		COMPASS: MC-323-A	Taking magnetic bearings.	KE 5334 Special SC	
307		CORD CC-66: two standard male plugs (PL-55), at each end, rubber molded cable 21" long.	Interconnecting cable between receiver and control unit.		
308		CANVAS COVER, BG-133-A: pantex style #2901, 16" x $12\frac{1}{2}$ " x 28", tapered at top, draw rope laced through brass grommets at the bottom of cover.	Cover for receiver.	GR	Stitching {#SC-D- 9025-K

d. Miscellaneous Parts (Cont'd)

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
309		COVER, BG-134-A: plastic film #30W40, composition resin VYNW of Carbide Carbon Chemical Co., 7" x 7" x 14" high, fabric tape 1" wide, 40" long, impregnated with 30W40, tape attached to cover.	Transparent cover for loop for handwheel.	SH	
310		HEADSET, HS-29-E	Audible reception, telephone line and receiver.	SC	
311		MICROPHONE, T-35: chest type	Telephone line microphone.	SC	
312		MOUNTING PLATE, FT-363-A	For mounting Control Unit RM-35-A and receiver unit.	RN	B-214-H
313		TRIPOD, LG-15-H: 3 leg telescoping type	Supports receiver for field operation.	RN	C256
.....		TUBES, vacuum, installed in receiver BC-973-A as follows: 1 ea. TUBE, VT134: commercial type 12A6 2 ea. TUBE, VT153: commercial type 12C8 2 ea. TUBE, VT161: commercial type 12SA7 1 ea. TUBE, VT162: commercial type 12SJ7 1 ea. TUBE, VT162: commercial type 12SJ7 2 ea. TUBE, VT209: commercial type 12SG7 2 ea. TUBE, VT209: commercial type 12SG7	Audio amp. 2d det. left and right. Detector mixer, left and right. H-f osc. Beat frequency osc. First i-f amp, left and right. Second i-f amp, left and right.		

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
314		KIT OF SPARE TUBES FOR BC-973-A: containing 2 ea. VT134. 2 ea. VT153. 2 ea. VT161. 2 ea. VT162. 4 ea. VT209. TUBES, vacuum installed in Receiver BC-1003-A as follows: 1 ea. TUBE, VT134: commercial type 12A6..... 2 ea. TUBE, VT153: commercial type 12C8..... 2 ea. TUBE, VT161: commercial type 12SA7..... 1 ea. TUBE, VT162: commercial type 12SJ7..... 1 ea. TUBE, VT162: commercial type 12SJ7..... 2 ea. TUBE, VT209: commercial type 12SG7..... 2 ea. TUBE, VT 209: commercial type 12SG7..... 2 ea. TUBE, VT209: commercial type 12SG7..... KIT OF SPARE TUBES FOR BC-1003-A containing: 2 ea. TUBE, VT134. 2 ea. TUBE, VT153. 2 ea. TUBE, VT161. 2 ea. TUBE, VT162. 6 ea. TUBE, VT209. BALL BEARING: single row annular, stainless steel, 1$\frac{3}{16}$" I.D. x 2$\frac{1}{4}$" O.D. x $\frac{9}{32}$" high.	Audio amp. 2d detector left and right. Detector mixer left and right. H-f osc. Beat freq. osc. First i-f amp, left and right. 2d i-f amp, left and right. 3d i-f amp, left and right. Supports loop appendage and permits rotation.		
315					
316				FA A544	

d. Miscellaneous Parts (Cont'd)

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
317		BRAKE: mechanical, aluminum, assembly mounted underneath top cover, 2 #6—32 mounting holes, $\frac{5}{8}$ " centers, brake actuated by knob mounted on top cover.	Lock handwheel to any desired setting.	RN	C232-H
318		BRAKE SHOE: zinc alloy die case, brake surface lined with neoprene $2\frac{5}{8}$ " x $\frac{5}{16}$ " x $\frac{1}{16}$ " thick, single mounting hole 0.187" diam.	Part of brake mechanism.	do.	A746-C
319		LOOP BRUSH CAN: aluminum extruded, $1\frac{3}{4}$ " x $1\frac{3}{4}$ " x 2.62", four mounting holes, 0.144" diam., 1.41" mounting centers, six extruded holes and tapped $\frac{3}{8}$ "—32, class 3 ft.	Loop brush can assembly connecting loop slip ring.	do.	A421C
320		BOTTOM COVER: cold rolled #16 steel, 12.87" x 11", 0.001" copper plate and 0.001" silver plated, four mounting holes, extruded $\frac{3}{16}$ " dial for #10—32 flat head screws, mounting centers 10.25" x 12.06", four Lord mounts riveted to bottom plate 8.62" x 10.5" mounting centers, four special nickel silver studs assembled on Lord mounts.	Receiver shock mount bottom cover.	do.	B247-H
321		TOP COVER: aluminum 3S half-hard $\frac{3}{4}$ " thick, $11\frac{13}{16}$ " x $13\frac{3}{4}$ ", clearance hole in center $4\frac{1}{8}$ " diam., four locks cam type $11\frac{11}{16}$ " x $9\frac{11}{16}$ " centers, inside top cover $\frac{1}{2}$ ", outside border not painted.	Receiver top cover.	do.	C231-G

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
322		HANDWHEEL ADJUSTING DISC: dural 17ST 8" O.D. x $\frac{3}{4}$ " I.D. x 0.093" high, outer edge surface masked, $\frac{3}{4}$ " before painting, five 0.250" diam. holes drilled on 3.937" radius center line, scale lock mounting hole $\frac{1}{4}$ " diam., $3\frac{7}{8}$ " radius center line, loop lock mounting hole $\frac{3}{4}$ " diam., 3" radius center line.	Central handwheel disc.	RN	B217-O
323		FREQUENCY ASSEMBLY: aluminum casting 1" x $\frac{1}{4}$ " x 4" high, dial face $2\frac{3}{4}$ " diam. with three brass spacers, riveted rear of dial face $\frac{1}{4}$ " O.D. x $\frac{1}{8}$ " I.D., planetary drive ratio 6:1 mounted rear of dial assembly, stainless steel co-axial shafts, outer shaft $\frac{1}{4}$ " diam., $\frac{3}{4}$ " long, inner shaft $\frac{1}{8}$ " diam., $1\frac{1}{16}$ " long, $2\frac{1}{2}$ " mounting holes 1" centers. POINTER: 0.020" steel, stamping $1\frac{1}{2}$ " long, brass bushing riveted to pointer $\frac{1}{4}$ " O.D. x $\frac{1}{4}$ " I.D. x $\frac{1}{32}$ " thick.	Tuning receiver to desired frequency.	do.	C244-E
324		BANDSWITCH ASSEMBLY: pinion gear, brass, $\frac{3}{4}$ " pitch diam., 24 pitch, 18 teeth, 2 8-32" set screw holes 120° apart, 0.253" I.D.; bevel gear, brass, $1\frac{1}{2}$ " pitch diam., 24 pitch, 36 teeth, 2-832" set screw holes, 120° apart 0.253" I.D.	Frequency dial indicator.	do.	A499
325		RUBBER GROMMET: gum rubber $\frac{5}{8}$ " O.D. x $\frac{3}{8}$ " I.D. x $\frac{5}{16}$ " high, $\frac{3}{32}$ " slot.	Bushing through hole in deck.	do.	A306-D
326		RUBBER GROMMET: gum rubber $1\frac{1}{16}$ " O.D. x $\frac{3}{8}$ " I.D. x $\frac{1}{4}$ " high, $\frac{1}{16}$ " slot.	do.	AR 1107-G	
327				do.	

d. Miscellaneous Parts (Cont'd)

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
328		RUBBER GROMMET: gum rubber $\frac{1}{16}$ " O.D. x $\frac{3}{16}$ " I.D. x $\frac{1}{32}$ " high, $\frac{1}{16}$ slot.	Bushing through hole in deck.	AR 1107-G	
329		RUBBER GROMMET: gum rubber, $\frac{11}{32}$ " O.D. x $\frac{1}{8}$ " I.D. x $\frac{3}{16}$ " high, $\frac{1}{16}$ slot.	do.	do.	
331		LOOP LOCK ASSEMBLY: knurled knob $\frac{5}{8}$ " O.D.; 10-32 tapped hole to receive pin $1\frac{1}{4}$ " long, $\frac{3}{8}$ " long x $\frac{3}{32}$ " diam. index pin, bushing with $\frac{15}{32}$ "-32 thread, class 2 on 0.468" O.D., phosphor bronze spring, $\frac{1}{4}$ " O.D. x $\frac{1}{16}$ " long as wound.	Prevent loop rotation.	RN	A597
332		LOOP PEDESTAL ASSEMBLY: machined aluminum casting, $1\frac{13}{16}$ " O.D. x $1\frac{1}{16}$ " I.D., tube with $2\frac{3}{8}$ " base containing four holes 8-32 tap; upper base is 4.625" O.D. with 2.2505" I.D. hole for ball bearing which supports loop appendage; overall length 4.625".	Receives loop.	do.	B251-D
333		SCALE LOCK ASSEMBLY: knurled knob $\frac{5}{8}$ " O.D. with press fit pin $\frac{15}{32}$ " long, $\frac{1}{4}$ "-24 thread class 2, $\frac{3}{16}$ " I.D., "C" washer, located $\frac{3}{4}$ " from end, holding adjusting clamp 1" x 1" x $\frac{3}{16}$ " with tapped hole $\frac{1}{4}$ "-32.	Prevents azimuth scale rotation with respect to	RN	B229-E Section A-A
334		SHOCK MOUNT: molded rubber fastened to 0.032" sheet plate with four 0.141" holes, 1" center to center; steel cylindrical protector 0.166" I.D. molded in rubber for mounting screw; outside dimensions of support plate $1\frac{1}{4}$ " x $1\frac{1}{4}$ ".	Tuning capacitor shock absorption.	LO 100PM-6	

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
335		BRUSHES: fine hard silver, $\frac{29}{32}$ " long, 0.219" O.D. of brush head, 6—32 x $\frac{1}{4}$ " thread on shaft, hole at end for soldered wire 0.043" hole, head has high rough polish.	Contacts slip rings of loop appendage.	RN	A388-E
336		STUD: $\frac{1}{4}$ " O.D. nickel silver rod, $2\frac{5}{16}$ " long, 8—32 x 0.164" diam., undercut $\frac{9}{32}$ " at one end, 6—32 x $\frac{3}{4}$ " diam. tap at other end $\frac{1}{2}$ " deep.	Supports brush can.	do.	A420-A
337		SCREW: undercut $1\frac{1}{2}$ " threaded at end 6—32 x $\frac{5}{16}$ " made from stainless steel overhead screw #6—32 x $\frac{1}{2}$ ".	Keeps meter bracket cover fastened.	do.	A739-A
338		SCREW TRIMMER GUARD PLUG: brass nickel-plated, $\frac{9}{16}$ " long, $\frac{9}{16}$ " diam., head $\frac{1}{16}$ " x 27 thread, class 2, counterbore $\frac{5}{16}$ " diam. $\frac{1}{16}$ " deep.	Covers trimmer windows.	do.	A801-A

e. Radio Receiver BC-1003-A (3 band)

NOTE: The first part of this table (ref. Nos. 401 through 471) includes parts that are the same as those in the previous table for the Radio Receiver BC-973-A (2 band). The original numbers of the previous table, which started from ref. No. 1, are used again in this table, but are increased by 400 to correspond with the 400-series numbering of this receiver.

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
401		Same as ref. No. 1	Radio gain or sensitivity control.		
402-a		Same as ref. No. 2-a	Volume (audio gain) control.		
402-b		Same as ref. No. 2-b	Balance output circuits.		
403		Same as ref. No. 3	Switches in balance control variable resistor ref. No. 2-b.		
405		Same as ref. No. 5	Voltage dropping for control unit microphone supply.		
406-1		Same as ref. No. 6-1	Cathode bias 1st i-f amp, left.		
406-2		Same as ref. No. 6-2	Cathode bias 1st i-f amp, right.		
406-3		Same as ref. No. 6-3	Cathode bias 2d i-f amp, left.		
406-4		Same as ref. No. 6-4	Cathode bias 2d i-f amp, right.		
406-5		Same as ref. No. 6	Cathode bias 3d i-f amp, left.		

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
406-6		Same as ref. No. 6	Cathode bias 3d i-f amp, right.		
406-8		Same as ref. No. 6	Drops sense voltage, C-band.		
407-1		Same as ref. No. 7	Cathode detector mixer, left.		
407-2		Same as ref. No. 7	Cathode detector mixer, right.		
408-1		Same as ref. No. 8	Cathode bias of audio amp.		
409-1		Same as ref. No. 9-1	Plate decoupling, det.-mixer, left.		
409-2		Same as ref. No. 9-2	Plate decoupling, det.-mixer, right.		
409-3		Same as ref. No. 9-3	Plate decoupling, 1st i-f, left.		
409-4		Same as ref. No. 9-4	Plate decoupling, 1st i-f, right.		
409-5		Same as ref. No. 9-5	Plate decoupling, 2d i-f, left.		
409-6		Same as ref. No. 9-6	Plate decoupling, 2d i-f, right.		
409-7		Same as ref. No. 9	Plate decoupling, 3d i-f amp, left.		
409-8		Same as ref. No. 9	Plate decoupling, 3d i-f amp, right.		

e. Radio Receiver BC-1003-A (3 band) (Cont'd)

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
410-1		Same as ref. No. 10	Drops sense voltage, A-band.		
410-2		Same as ref. No. 10	Drops sense voltage, B-band.		
411		Same as ref. No. 11	Plate dropping resistor of h-f oscillator.		
412-1		Same as ref. No. 12-1	Grid leak of left det-mixer injector grid.		
412-2		Same as ref. No. 12-2	Grid leak of right det-mixer injector grid.		
412-3		Same as ref. No. 12-3	Screen dropping resistor, 1st i-f amp, left.		
412-4		Same as ref. No. 12-4	Screen dropping resistor, 1st i-f amp, right.		
412-5		Same as ref. No. 12-5	Screen dropping resistor, 2d i-f amp, left.		
412-6		Same as ref. No. 12-6	Screen dropping resistor, 2d i-f amp, right.		
412-7		Same as ref. No. 12	Screen decoupling, 3d i-f amp, left.		
412-8		Same as ref. No. 12	Screen decoupling, 3d i-f amp, right.		
413-1		Same as ref. No. 13-1	Screen bleeder det.-mixer, left.		
413-2		Same as ref. No. 13-2	Screen bleeder det.-mixer, right.		
413-3		Same as ref. No. 13-3	Screen bleeder, 1st i-f, left.		

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
413-4		Same as ref. No. 13-4	Screen bleeder, 1st i-f, right.		
413-5		Same as ref. No. 13-5	Screen bleeder, 2d i-f, left.		
413-6		Same as ref. No. 13-6	Screen bleeder, 2d i-f, right.		
413-7		Same as ref. No. 13-7	Grid leak, h-f oscillator.		
413-9		Same as ref. No. 13-9	B-f-o grid leak.		
413-10		Same as ref. No. 13-10	Drops screen voltage detector, right.		
413-11		Same as ref. No. 13-11	Drops screen voltage detector, left.		
413-12		Same as ref. No. 13	Screen bleeder, 3d i-f amp, right.		
413-13		Same as ref. No. 13	Screen bleeder, 3d i-f amp, left.		
413-14		Same as ref. No. 13-12	Bleeder, right movement, meter circuit.		
412-15		Same as ref. No. 13-13	Bleeder, left movement, meter circuit.		
413-16		Same as ref. No. 13	A-v-c decoupling, right.		
413-17		Same as ref. No. 13	A-v-c decoupling, left.		
414-1		Same as ref. No. 14-1	Plate filter, 2d detector, left.		
414-2		Same as ref. No. 14-2	Plate filter, 2d detector, right.		
414-3		Same as ref. No. 14-3	Plate filter, 2d detector.		

e. Radio Receiver BC-1003-A (3 band) (Cont'd)

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
415-3		Same as ref. No. 15-3	Grid decoupling, 1st i-f, left.		
415-4		Same as ref. No. 14-4	Grid decoupling, 1st i-f, right.		
415-5		Same as ref. No. 14-5	Grid decoupling, 2d i-f, left.		
415-6		Same as ref. No. 14-6	Grid decoupling, 2d i-f, right.		
415-7		Same as ref. No. 15	Grid decoupling, 3d i-f amp, left.		
415-8		Same as ref. No. 15	Grid decoupling, 3d i-f amp, right.		
415-9		Same as ref. No. 15	Drops A-v-c voltage.		
416		Same as ref. No. 16-1	Drops plate voltage (b-f-o).		
417-1		Same as ref. No. 17-1	Grid leak, 2d detector, left.		
417-2		Same as ref. No. 17-2	Grid leak, 2d detector, right.		
417-3		Same as ref. No. 17-3	Grid leak, audio amp.		
417-4		Same as ref. No. 17-4	Drops screen voltage, 2d detector, left and right.		
418-1		Same as ref. No. 18-1	A-v-c diode load, 2d detector, left.		
418-2		Same as ref. No. 18-2	A-v-c diode load, 2d detector, right.		
418-3		Same as ref. No. 18-3	Drops Rf input to grid of 2d detector, left.		

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
418-4		Same as ref. No. 18-4.....	Drops r-f input to grid of 2d detector, right.		
418-5		Same as ref. No. 18-5.....	Series A-v-c filter, 2d detector, left.		
418-6		Same as ref. No. 18-6.....	Series A-v-c filter, 2d detector, right.		
418-8		Same as ref. No. 18-8.....	Drops screen voltage, b-f-o.		
419-a,b,c,d		Same as ref. No. 19-a, b, c, d	Main tuning capacitor.		
420-1a, b		Same as ref. No. 20-1a, b	Trimmer, 1st i-f, left.		
420-2a, b		Same as ref. No. 20-2a, b	Trimmer, 1st i-f, right.		
420-3a, b		Same as ref. No. 20-3a, b	Trimmer, 2d i-f, left.		
420-4a, b		Same as ref. No. 20-4a, b	Trimmer, 2d i-f, right.		
420-5a, b		Same as ref. No. 20.....	Trimmer, 3d i-f transformer, left.		
420-6a, b		Same as ref. No. 20.....	Trimmer, 3d i-f transformer, right.		
421-1		Same as ref. No. 21-1.....	Trimmer left diode.		
421-2		Same as ref. No. 21-2.....	Trimmer right diode.		
421-3		Same as ref. No. 21-3.....	Parallel trimmer (b-f-o)		
422-1		Same as ref. No. 22-1.....	Parallel trimmer, A-band, h-f osc.		
422-2		Same as ref. No. 22-2.....	Parallel trimmer, B-band, h-f osc.		
422-3		Same as ref. No. 22.....	Parallel trimmer, h-f osc, C-band.		

e. Radio Receiver BC-1003-A (3 band) (Cont'd)

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
422-4		Same as ref. No. 22	Padder, series h-f osc., A-band.		
422-5		Same as ref. No. 22	Padder, series h-f osc., B-band.		
422-6		Same as ref. No. 22	Padder, series h-f osc., C-band.		
423-1		Same as ref. No. 23-1	Loop trimmer, B-band, left.		
423-2		Same as ref. No. 23-2	Loop trimmer, B-band, right.		
423-3		Same as ref. No. 23-3	Loop trimmer, A-band, left.		
423-4		Same as ref. No. 23-4	Loop trimmer, A-band, right.		
423-5		Same as ref. No. 23	Trimmer, loop C-band, left.		
423-6		Same as ref. No. 23	Trimmer, loop C-band, right.		
425-1		Same as ref. No. 25	Padder, fixed, h-f osc., A-band.		
426-1		Same as ref. No. 26-1	Couples h-f osc. to injector grid, left.		
426-2		Same as ref. No. 26-2	Couples h-f osc. to injector grid, right.		
426-3		Same as ref. No. 26	Resonates coil h-f osc., B-band.		
427		Same as ref. No. 27	Resonates coil, series osc., A-band.		

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
428-1		Same as ref. No. 28-1	Couples r-f, blocks audio from 2d detector grid, left.		
428-2		Same as ref. No. 28-2	Couples r-f, blocks audio from 2d detector grid, right.		
428-3		Same as ref. No. 28-3	R-f filter by-pass, 2d detector plate, left.		
428-4		Same as ref. No. 28-4	R-f filter by-pass, 2d detector plate, right.		
429-1		CAPACITOR: fixed; 100 μ f $\pm$ 2%; silver mica, 500-volt DC; $1\frac{1}{16}$ " $\times$ $\frac{7}{16}$ " $\times$ $\frac{3}{16}$ ", #20 axial leads $1\frac{1}{2}$ " long.	Loop tuning A-band, left.	CD 5R	
429-2		Same as ref. No. 429-1	Loop tuning A-band right.	do.	
432		Same as ref. No. 32	Grid coupling b-f-o.		
435-1		CAPACITOR: fixed; 0.001 μ f $\pm$ 10%, mica; 500-volt DC; low-loss bakelite case $2\frac{3}{8}$ " $\times$ $1\frac{5}{8}$ " $\times$ 0.20", 0.032" axial leads $1\frac{1}{8}$ " long.	A-v-c decoupling, left.	SA K-1210	
435-2		Same as ref. No. 435-1	A-v-c decoupling, right.		
436-1		Same as ref. No. 36-1	By-pass, meter diode, 2d detector, left.	do.	
436-2		Same as ref. No. 36-2	By-pass, meter diode, 2d detector, right.		
436-3		Same as ref. No. 36	By-pass plate, audio amp.		
436-5		Same as ref. No. 36-5	Couples h-f osc. tube plate to h-f osc. circuit.		

e. Radio Receiver BC-1003-A (3 band) (Cont'd)

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
436-6		Same as ref. No. 36.....	By-pass plate, 2d detector, right.		
436-7		Same as ref. No. 36.....	By-pass plate, 2d detector, left.		
437-1		Same as ref. No. 37-1.....	Filter, A-v-c diode, 2d detector, left.		
437-2		Same as ref. No. 37-2.....	Filter, A-v-c diode, 2d detector, right.		
437-3		Same as ref. No. 37-3.....	By-pass, screen, b-f-o.		
437-4		Same as ref. No. 37.....	By-pass, a-v-c.		
438-1		Same as ref. No. 38-1.....	Meter, by-pass, left.		
438-2		Same as ref. No. 38-2.....	Meter by-pass, right.		
438-3		Same as ref. No. 38-3.....	Audio amplifier grid coupling.		
438-4		Same as ref. No. 38-4.....	Plate coupling b-f-o, or VT162 screen by-pass.		
438-5		Same as ref. No. 38-5.....	Sensitivity control by-pass.		
438-7		Same as ref. No. 38.....	Output coupling audio amp.		
439-1a		Same as ref. No. 39-1a.....	By-pass, mixer cathode, left.		
439-1b		Same as ref. No. 39-1b.....	By-pass, mixer screen, left.		
439-2a		Same as ref. No. 39-2a.....	By-pass, mixer cathode, right.		
439-2b		Same as ref. No. 39-2b.....	By-pass, mixer screen, right.		

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
439-3a		Same as ref. No. 39-3a	By-pass, mixer plate, left.		
439-3b		Same as ref. No. 39-3b	By-pass, 1st i-f grid, left.		
439-4a		Same as ref. No. 39-4a	By-pass, mixer plate, right.		
439-4b		Same as ref. No. 39-4b	By-pass, 1st i-f grid, right.		
439-5a		Same as ref. No. 39-5a	By-pass, 1st i-f cathode, left.		
439-5b		Same as ref. No. 39-5b	By-pass, 1st i-f screen, left.		
439-6a		Same as ref. No. 39-6a	By-pass, 1st i-f cathode, right.		
439-6b		Same as ref. No. 39-6b	By-pass, 1st i-f screen, right.		
439-7a		Same as ref. No. 39-7a	By-pass, 1st i-f plate, left.		
439-7b		Same as ref. No. 39-7b	By-pass, 2d i-f grid, left.		
439-8a		Same as ref. No. 39-8a	By-pass, 1st i-f plate, right.		
439-8b		Same as ref. No. 39-8b	By-pass, 2d i-f grid, right.		
439-9a		Same as ref. No. 39-9a	By-pass, 2d i-f cathode, left.		
439-9b		Same as ref. No. 39-9b	By-pass, 2d i-f screen, left.		
439-10a		Same as ref. No. 39-10a	By-pass, 2d i-f cathode, right.		

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
439-10b		Same as ref. No. 39-10b	By-pass, 2d i-f screen, right.		
439-11a		Same as ref. No. 39	By-pass, plate, 2d i-f amp, left.		
439-11b		Same as ref. No. 39	Grid, i-f return, 3d amp, left.		
439-12a		Same as ref. No. 39	By-pass, plate, 2d i-f amp, right.		
439-12b		Same as ref. No. 39	By-pass, grid return, 3d i-f amp, right.		
439-13a		Same as ref. No. 39	By-pass, cathode, 3d i-f amp, left.		
439-13b		Same as ref. No. 39	By-pass, screen, 3d i-f amp, left.		
439-14a		Same as ref. No. 39	By-pass, cathode, 3d i-f amp, right.		
439-14b		Same as ref. No. 39	By-pass, screen, 3d i-f amp, right.		
440-1		Same as ref. No. 40	By-pass, plate, 3d i-f amp, left.		
440-2		Same as ref. No. 40	By-pass, plate, 3d i-f amp, right.		
440-3		Same as ref. No. 40-3	By-pass, B+ bus.		
440-5		Same as ref. No. 40-5	By-pass, A+ bus.		
441-2		Same as ref. No. 41-2	By-pass, balance, switch.		
441-3		Same as ref. No. 41-3	Cathode by-pass, audio amp.		

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
442-1		Same as ref. No. 42-1	Meter damping, right movement.		
442-2		Same as ref. No. 42-2	Meter damping, left movement.		
443		Same as ref. No. 43	Direction indicator.		
450		Same as ref. No. 50	Loop slip rings.		
456-1		Same as ref. No. 56-1	Receptacle for headset plug or patch cord plug.		
456-2		Same as ref. No. 56-2	Receptacle for patch cord plug.		
457		Same as ref. No. 57	Connects loop antenna to loop slip rings.		
458		Same as ref. No. 58	Connects loop slip rings to loop antenna.		
459		Same as ref. No. 59	Connects meter to meter receptacle in chassis.		
460		Same as ref. No. 60	Receptacle for direction indicator meter.		
461		Same as ref. No. 61	Connects power cable to receiver.		
462-1		Same as ref. No. 62-1	Light switch.		
462-2		Same as ref. No. 62-2	C-w osc., on and off switch.		
462-3		Same as ref. No. 62-3	A-v-c, on and off switch.		
463		Same as ref. No. 63	Mounting sense indication.		

e. Radio Receiver BC-1003-A (3 band) (Cont'd)

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
464-1		Same as ref. No. 64-1.....	Power switch on and off.		
464-2		Same as ref. No. 64-2.....	Meter damp on and off.		
465a, b, c, d		Same as ref. No. 65a, b, c, d.....	Band selection.		
466-1		Same as ref. No. 66-1.....	Balance circuit switch.		
466-2		Same as ref. No. 66-2.....	Balance circuit switch.		
466-3		Same as ref. No. 66-3.....	Sense circuit switching.		
467		Same as ref. No. 67.....	B.f.o. switch circuit.		
468		Same as ref. No. 68.....	Sense antenna.		
469-1		Same as ref. No. 69-1.....	Pilot light.		
469-2		Same as ref. No. 69-2.....	Pilot light.		
469-3		Same as ref. No. 69-3.....	Pilot light.		
470-1		Same as ref. No. 70-1.....	Front panel pilot light.		
470-2		Same as ref. No. 70-2.....	Front panel pilot light.		
470-3		Same as ref. No. 70-3.....	Front panel pilot light.		
471-1		Same as ref. No. 71-1.....	Tube sockets.		
through 471-13					
473		RESISTOR: fixed; carbon, composition element, ceramic coating; 20 ohm, $\frac{1}{2}$ watt; $\frac{1}{16}$ " x $\frac{3}{16}$ " axial leads. (May vary $\pm$ 10 ohms in individual sets. See par. 17.)	Sensitivity adjustment (radio gain).	ER 504	
474-2		RESISTOR: fixed; carbon composition element, ceramic coating; 10,000 ohm $\pm$ 5%, $\frac{1}{2}$ watt; $\frac{1}{16}$ " x $\frac{3}{16}$ " axial leads.	Meter bleeder series, right.	do.	
474-3		Same as 474-2.....	Meter bleeder series, left.	do.	

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
475		RESISTOR: fixed; wire wound, cement coating; 10,000 ohms, 5 watts; 1" x $\frac{3}{16}$ " I.D., $\frac{1}{4}$ " terminal with $\frac{1}{8}$ " hole, $\frac{5}{8}$ " mounting centers.	Plate dropping audio amplifier.	CL A5F	
476-1		RESISTOR: fixed; carbon composition element, ceramic coating; 1,000 ohm $\pm$ 5%, $\frac{1}{2}$ watt; $\frac{1}{16}$ " x $\frac{3}{16}$ " axial leads.	Loop return.	ER 504	
478		CAPACITOR: fixed; 15 μ f $\pm$ 2%, 500-volt DC; silver mica, low-loss bakelite case $\frac{11}{16}$ " x $\frac{1}{16}$ " x $\frac{3}{16}$ ", #20 axial leads $1\frac{1}{2}$ " long.	Parallel with trimmer, C-band h-f osc.	ER K	
479		CAPACITOR: fixed; 35 μ f $\pm$ 2%, 500-volt DC; silver mica, low-loss bakelite case $\frac{11}{16}$ " x $\frac{1}{16}$ " x $\frac{3}{16}$ ", #20 axial leads $1\frac{1}{2}$ " long.	Parallel with trimmer, A-band h-f osc.	do.	
480		CAPACITOR: fixed; 55 μ f $\pm$ 2%, 500-volt DC; silver mica, low-loss bakelite case $\frac{11}{16}$ " x $\frac{1}{16}$ " x $\frac{3}{16}$ ", #20 axial leads $1\frac{1}{2}$ " long.	Parallel with series pad-der, B-band h-f osc.	CD 5R	
481-1		CAPACITOR: fixed; 70 μ f $\pm$ 2%, 500-volt DC; silver mica, low-loss bakelite case $\frac{11}{16}$ " x $\frac{1}{16}$ " x $\frac{3}{16}$ ", #20 axial leads $1\frac{1}{2}$ " long.	Tunes plate coil of diode transformer, left.	do.	
481-2		Same as ref. No. 481-1	Tunes plate coil of diode transformer, right.	do.	
482		CAPACITOR: fixed; 125 μ f $\pm$ 2%, 500-volt DC; silver mica, low-loss bakelite case $\frac{11}{16}$ " x $\frac{1}{16}$ " x $\frac{3}{16}$ ", #20 axial leads $1\frac{1}{2}$ " long.	B-f-o circuit.	do.	
483-1		CAPACITOR: fixed; 155 μ f $\pm$ 2%, 500-volt DC; silver mica, low-loss bakelite case $\frac{11}{16}$ " x $\frac{1}{16}$ " x $\frac{3}{16}$ ", #20 axial leads $1\frac{1}{2}$ " long.	Tunes 1st i-f transformer plate, left.	do.	

e. Radio Receiver BC-1003-A (3 band) (Cont'd)

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
483-2		Same as ref. No. 483-1	Tunes 1st i-f transformer plate, right.	CD	
483-3		Same as ref. No. 483-1	Tunes 1st i-f grid, left.	5R	
483-4		Same as ref. No. 483-1	Tunes 1st i-f grid, right.	do.	
483-5		Same as ref. No. 483-1	Tunes 2d i-f transformer plate, left.	do.	
483-6		Same as ref. No. 483-1	Tunes 2d i-f transformer plate, right.	do.	
483-7		Same as ref. No. 483-1	Tunes 2d i-f transformer grid, left.	do.	
483-8		Same as ref. No. 483-1	Tunes 2d i-f transformer grid, right.	do.	
483-9		Same as 483-1	Tunes 3d i-f transformer plate, left.	do.	
483-10		Same as ref. No. 483-1	Tunes 3d i-f transformer plate, right.	do.	
483-11		Same as ref. No. 483-1	Tunes 3d i-f transformer grid, left.	do.	
483-12		Same as ref. No. 483-1	Tunes 3d i-f transformer grid, right.	do.	
484-1		COIL: i-f transformer; 56 microhenries, 1.5 ohms; 3.5 μ f distributed capacity, tapped at an inductance of 31 microhenries; litz wire, universal winding on a powdered iron core $\frac{3}{16}$ " I.D. x $\frac{3}{8}$ " O.D. x $\frac{1}{2}$ " long; matched with 484-2.	1625 kc, 1st i-f transformer, left.	SI 12635	A475-2

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
484-2		Same as 484-1, matched with 484-1.....	1625 kc, 1st i-f trans-former, right.	do.	A475-2
485-1		Same as 484-1, matched with 485-2.....	1625 kc, 2d i-f trans-former, left.	SI 12635	A475-2
485-2		Same as 484-1, matched with 485-1.....	1625 kc, 2d i-f trans-former, right.	do.	A475-2
486-1		Same as 484-1, matched with 486-2.....	1625 kc, 3d i-f trans-former, left.	do.	A475-2
486-2		Same as 484-1, matched with 486-1.....	1625 kc, 3d i-f trans-former, right.	do.	A475-2
487-1		COIL: 3 windings, i-f, a-v-c, diode litz wire, closely coupled, primary inductance is 0.1 millihenry, Q of 50, R of 3.5 ohm, secondary inductance is 0.1 millihenry, Q of 42, R of 2 ohms, the tertiary inductance is 1 millihenry, Q of 53, R of 2 ohms, mounted on $\frac{3}{8}$ " O.D. bakelite post. Same as 487-1, matched with 487-1.....	4th i-f and diode trans-former, left.	SI 12583B	A698
487-2			4th i-f and diode trans-former, right.	do.	A698
488		COIL: 4.75 millihenries, Q of 104, bucking connection, litz wire, powdered iron core $\frac{3}{16}$ " I.D. $\frac{3}{8}$ " O.D. x $\frac{1}{2}$ " long, protected by bakelite jacket $\frac{3}{4}$ " I.D. x $1\frac{1}{4}$ " long x $\frac{1}{16}$ " wall, mounted on ceramic base.	Induces sense voltage, A-band.	SI 12664	A962
489		COIL: 0.148 millihenry, Q of 53, bucking connection, litz wire, powdered iron core $\frac{3}{16}$ " I.D. x $\frac{3}{8}$ " O.D. x $\frac{1}{16}$ " wall, mounted on ceramic base, protected by bakelite jacket $\frac{3}{4}$ " I.D. x $1\frac{1}{4}$ " long x $\frac{1}{16}$ " wall.	Induces sense voltage, B-band.	SI 12665	A962

e. Radio Receiver BC-1003-A (3 band) (Cont'd)

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
490		COIL: 0.266 millihenry measured at 1 mc, Q of 138, bucking connection, litz wire, powdered iron core $\frac{3}{16}$ " I.D. x $\frac{3}{8}$ " O.D. x $\frac{1}{2}$ " long, protected, baked, lite jacket $\frac{3}{4}$ " I.D. x $1\frac{1}{4}$ " long x $\frac{1}{16}$ " wall, mounted on ceramic base.	Induces sense voltage, C-band.	SI 12666	A962
491-1		LOOP: 55 turn, 3 layers #22 green silk covered magnet wire, 1 millihenry, distributed capacity 44 μ mf, resistance of 2.5 ohms, Q of 50 at 250 kc.	Loop antenna, left channel #1-#3.	RN	
491-2		Same as 491-1.....	Loop antenna, right channel #2-#4.	do.	
492-1		COIL: r-f 0.267 millihenry, distributed capacity 7 μ mf, resistance 2.5 ohm, litz wire, Q is 177 at 1 mc, mounted on powdered iron core $\frac{3}{8}$ " diam. x $\frac{1}{2}$ " long, assembled on ceramic base, mounted with 493-1 in aluminum can $1\frac{3}{8}$ " x $1\frac{3}{8}$ " long, matched with 492-2.	Loop loading shunt, C-band, left.	SI 12669	
492-2		Same as 492-1, matched with 492-1, mounted with 493-2 in aluminum can $1\frac{3}{8}$ " x $1\frac{3}{8}$ " x $3\frac{1}{8}$ " long.	Loop loading shunt, C-band, right.	I 12669	
493-1		COIL: r-f, 3.3 millihenry, distributed capacity, 5.7 μ mf, resistance 15 ohms, litz wire, Q is 168 at 300 kc, mounted on powdered iron core $\frac{3}{8}$ " diam. x $\frac{1}{2}$ " long, assembled on ceramic base, mounted with 492-1 in aluminum can $1\frac{3}{8}$ " x $1\frac{3}{8}$ " long, matched with 493-2.	Loop loading series, A-band, left.	SI 12668	
493-2		Same as 493-1, matched with 493-1, mounted with 492-2 in aluminum can $1\frac{3}{8}$ " x $1\frac{3}{8}$ " x $3\frac{1}{8}$ " long.	Loop loading series, A-band, right.	do.	

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
494		COIL: r-f, oscillator, grid coil, 0.06 millihenry, 15 $\mu\mu\text{f}$, distributed capacity, 1.6 ohms resistance, Q is 35 at 1200 kc, leads colored green and black; plate coil 6 microhenry, 7 $\mu\mu\text{f}$ distributed capacity, 1.2 ohm resistance, Q is 10 at 3000 kc; leads colored blue and red; closely coupled universal winding on $\frac{1}{2}$ " O.D. black bakelite form containing threaded powdered iron core; blue color identifies coil assembly.	H-f oscillator, A-band.	ES A186	
495		COIL: r-f, oscillator, grid coil, 0.06 millihenry, 11 $\mu\mu\text{f}$ distributed capacity, 1.7 ohms resistance, Q is 43 at 1000 kc, leads colored green and black; plate coil 3 microhenry, 10 $\mu\mu\text{f}$ distributed capacity, 0.8 ohm resistance, Q is 15 at 4500 kc; leads colored blue and red; closely coupled universal winding on $\frac{1}{2}$ " O.D. black bakelite form containing threaded powdered iron core; orange color identifies coil assembly.	H-f oscillator, B-band.	ES A186	
496		COIL: r-f, oscillator, grid coil, 37 microhenry, 9 $\mu\mu\text{f}$ distributed capacity, 1.5 ohms resistance, Q is 50 at 1200 kc, leads colored green and black; plate coil 1.3 microhenry, 11 $\mu\mu\text{f}$ distributed capacity, 0.4 ohm resistance, Q is 21 at 7 mc, leads colored blue and red; closely coupled universal winding on $\frac{1}{2}$ " O.D. black bakelite form containing threaded powdered iron core; green color identifies coil assembly.	H-f oscillator, C-band.	ES A187	

e. Radio Receiver BC-1003-A (3 band) (Cont'd)

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
497		COIL: b-f-o grid to tap, 0.04 millihenries, 11 μ f distributed capacity, 3 ohms resistance, green lead to yellow-red; grid to ground 0.075 millihenry, 8 μ f distributed capacity, 4.5 ohms resistance, green lead to black lead; litz wire, universal winding, closely coupled on $\frac{1}{2}$ " O.D. bakelite tube 2" long.	Beat frequency oscillator, 1625 kc.	SI 12661	
498-1		CAPACITOR: fixed; 25 μ f $\pm$ 5%; silver mica, 500-volt DC; low-loss bakelite case $1\frac{1}{16}$ " x $\frac{7}{16}$ " x $\frac{3}{16}$ ", #20 axial leads $1\frac{1}{2}$ " long.	H-f oscillator, C-band.	CD 5R	
498-2		Same as 498-1	Corrects over-coupling double peak in 1st i-f, right.	do.	
498-3		Same as 498-1	Corrects over-coupling double peak in 1st i-f, left.	do.	
499		CAPACITOR: fixed; 120 μ f $\pm$ 5%; silver mica, 500-volt DC; low-loss bakelite case $1\frac{1}{16}$ " x $\frac{7}{16}$ " x $\frac{3}{16}$ ", #20 axial leads $1\frac{1}{2}$ " long. (May be made up of two capacitors numbered 499a and 499b, totaling 120 μ f.)	H-f oscillator, C-band.	CD 5R	
501-1		I-F ASSEMBLY: 1625 kc in aluminum can $1\frac{1}{2}$ " x 2" x 4" with riveted spade lugs 6—32 thread, two holes $\frac{1}{16}$ " diam. on top; contains parts ref. Nos. 420-1a, 420-1b, 483-1, 483-3, 484-1, and 498.3. Same as 501-1, contains parts ref. Nos. 420-2a, 420-2b, 483-2, 483-4, 484-2, and 498-2.	Left channel 1st i-f, 1625 kc matched with 501-2.	RN	A993
501-2			Right channel 1st i-f, 1625 kc matched with 501-1.	do.	A993

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
502-1		Same as 501-1, contains parts ref. Nos. 420-3a, 420-3b, 483-5, 483-7, and 485-1.	Left channel, 2d i-f 1625 kc matched with 502-2.	RN	A994
502-2		Same as 501-1, contains parts ref. Nos. 420-4a, 420-4b, 483-6, 483-8, and 485-2.	Right channel 2d i-f 1625 kc matched with 502-1.	do.	A994
503-1		Same as 501-1, contains parts ref. Nos. 420-5a, 420-5b, 483-9, 483-11, and 486-1.	Left channel, 3d i-f 1625 kc matched with 503-2.	do.	A995
503-2		Same as 501-1, contains parts ref. Nos. 420-6a, 420-6b, 483-10, 483-12, and 486-2.	Right channel, 3d i-f, 1625 kc matched with 503-1.	do.	A995
504-1		I-F and DIODE ASSEMBLY: 1625 kc in aluminum can $1\frac{1}{2}$ " x 2" x 4" with riveted spade lugs 6—32 thread, one hole $\frac{1}{16}$ " diam. on top; contains ref. Nos. 421-1, 481-1, 418-3, 428-1, 417-1, 418-1, 437-1, 436-1, 418-5, 413-17, 435-1, 474-3, and 487-1.	Left channel, 4th i-f and diode, 1625 kc matched with 504-2.	do.	A996
504-2		Same as 504-1, contains ref. Nos. 421-2, 481-2, 428-2, 418-4, 417-2, 418-2, 437-2, 436-2, 418-6, 413-16, 435-2, 474-2, and 487-2.	Right channel, 4th i-f and diode, 1625 kc matched with 504-1.	do.	A996
505		Same as 504-1, contains ref. Nos. 482, 497, 421-3, 432, 413-9.	Beat frequency oscillator, 1625 kc.	do.	A997
506		DUAL CONTROL ASSEMBLY: same as ref. No. 106.			
507		H-F OSCILLATOR ASSEMBLY: mounted on $\frac{3}{8}$ " thick aluminum bracket, 2.437" x 2.281" x 4.000" with cover; contains ref. Nos. 494, 495, 496, 427, 422-4, 425-1, 422-1, 479, 426-3, 480, 422-5, 422-2, 498-1, 499, 422-6, 478, 422-3, 436-5 and 413-7.	H-f oscillator assembly, A-B-C bands.	do.	B269 AA326
508		LOOP APPENDAGE ASSEMBLY: same as ref. No. 108.		do.	

e. Radio Receiver BC-1003-A (3 band) (Cont'd)

Reference No.	Signal Corps stock No.	Name of part and description	Function	Manufacturers code and type No.	Contractors part or drawing No.
509		LOOP ASSEMBLY LP-33-A: including ref. Nos. 491-1, 491-2, and 457.	Directional antenna system.	do.	C241-D
520-1		RESISTOR: fixed; 100 ohm $\pm$ 5%, $\frac{1}{2}$ watt; carbon composition element, ceramic coating, #20 axial leads $1\frac{1}{2}$ " long.	Negative feed back, 1st i-f tube, left.	ER 504	
520-2		Same as 520-1	Negative feed back, 1st i-f tube, right.	do.	
520-3		Same as 520-1	Negative feed back, 2nd i-f tube, left.	do.	
520-4		Same as 520-1	Negative feed back, 2nd i-f tube, right.	do.	
520-5		Same as 520-1	Negative feed back, 3rd i-f tube, left.	do.	
520-6		Same as 520-1	Negative feed back, 3rd i-f tube, right.	do.	
600		CAPACITOR: fixed; 300 μ f $\pm$ 5%; silver mica, 500-volt DC, low-loss bakelite case, $1\frac{1}{16}$ " x $\frac{1}{16}$ " x $\frac{3}{16}$ ", #20 axial leads $1\frac{1}{2}$ " long.	By-pass loop return.	CD 5R	
601		GROUND CONTACT: phosphor bronze tinned, #22 B&S gauge, $\frac{3}{8}$ " x $2\frac{1}{8}$ " x $2\frac{1}{8}$ " developed length, bent 0.144" hole at one end, bump at the other.	Ground brush can to bottom cover.	RN	A971
602		REAR GROUND SHIELD: copper zinc plated, 11" x $3\frac{15}{16}$ " x 0.017", two $\frac{1}{2}$ " diam. holes, $10\frac{3}{4}$ " x $2\frac{3}{4}$ " centers, two mounting holes countersunk for 6—32 screws, $5\frac{3}{8}$ " x $\frac{5}{16}$ " mounting centers.	Shield cover for rear compartment of receiver.		AA312-B

Additional Components

See note at beginning of part 1, for additional components used with the BC-1003-A, such as the following:

Dynamotor supply unit, Control Unit
RM-35-A, and Miscellaneous Parts.

30. LIST OF MANUFACTURERS.

<i>Code</i>	<i>Name</i>	<i>Address</i>
AE	Advance Electric Corp.	Los Angeles, Calif.
AP	American Phenolic Corp.	Chicago, Ill.
AR	American Radio Hardware Co.	New York, N. Y.
AW	Automatic Winding Co., Inc.	Harrison, N. J.
BC	L. S. Brach Mfg. Corp.	Newark, N. J.
BR	Breeze Corp.	Newark, N. J.
CA	Cannon Electric Development Co.	Los Angeles, Calif.
CD	Cornell-Dubilier Corp.	So. Plainfield, N. J.
CH	Cutler-Hammer Inc.	Milwaukee, Wisc.
CL	Clarostat Mfg. Co.	Brooklyn, N. Y.
CT	Chicago Tele. Supply Co.	Elkhart, Ind.
ER	Erie Resistor Corp.	Erie, Penna.
ES	Essex Electronics	Berkeley Heights, N. J.
EX	Electric Storage Battery Co. (Exide)	Philadelphia, Penna.
FA	Fafnir Bearing Corp.	New Britain, Conn.
GE	General Electric Co.	Bridgeport, Conn.
GR	John Griffin & Son	Brooklyn, N. Y.
HA	Hammarlund Mfg. Corp.	New York, N. Y.
HU	Harvey Hubbell Inc.	Bridgeport, Conn.
KE	Keuffel and Esser	Hoboken, N. J.
LI	Littelfuse Inc.	Chicago, Ill.
LO	Lord Mfg. Co.	Erie, Penna.
MA	P. R. Mallory & Co.	Indianapolis, Ind.
MI	Micamold Radio Corp.	Brooklyn, N. Y.
PI	Pioneer Gen-E-Motor	Chicago, Ill.
RH	Reich-Hela Corp.	New York, N. Y.
RN	Radio Navigational Instrument Corp.	New York, N. Y.
SA	Sangamo Electric Co.	Springfield, Ill.
SC	Signal Corps.	Philadelphia, Penna.
SH	Shellmar Products	New York, N. Y.
SI	F. W. Sickles Co.	Springfield, Mass.
TE	Telephonics Corp.	New York, N. Y.
UL	A. J. Ulmer Co.	New York, N. Y.
UN	United Transformer Corp.	New York, N. Y.
WE	Weston Electrical Instrument Corp.	Newark, N. J.

LEGEND (BC-973-A)

<i>Reference No.</i>	<i>Name of Part</i>	<i>Value</i>	<i>Tolerance</i>
1	Potentiometer	1,500 ohm	2W
2a	Potentiometer	20,000 ohm	2W
2b	Potentiometer	60,000 ohm	2W
3	SPST Switch in dual control		
4	Resistor, Fixed	25 ohm	1W $\pm$ 5%
5	Resistor, Fixed	50 ohm	$\frac{1}{2}$ W $\pm$ 5%
6	Resistor, Fixed	300 ohm	$\frac{1}{2}$ W $\pm$ 5%
7	Resistor, Fixed	500 ohm	$\frac{1}{2}$ W $\pm$ 5%
8	Resistor, Fixed	1,000 ohm	$\frac{1}{2}$ W $\pm$ 5%

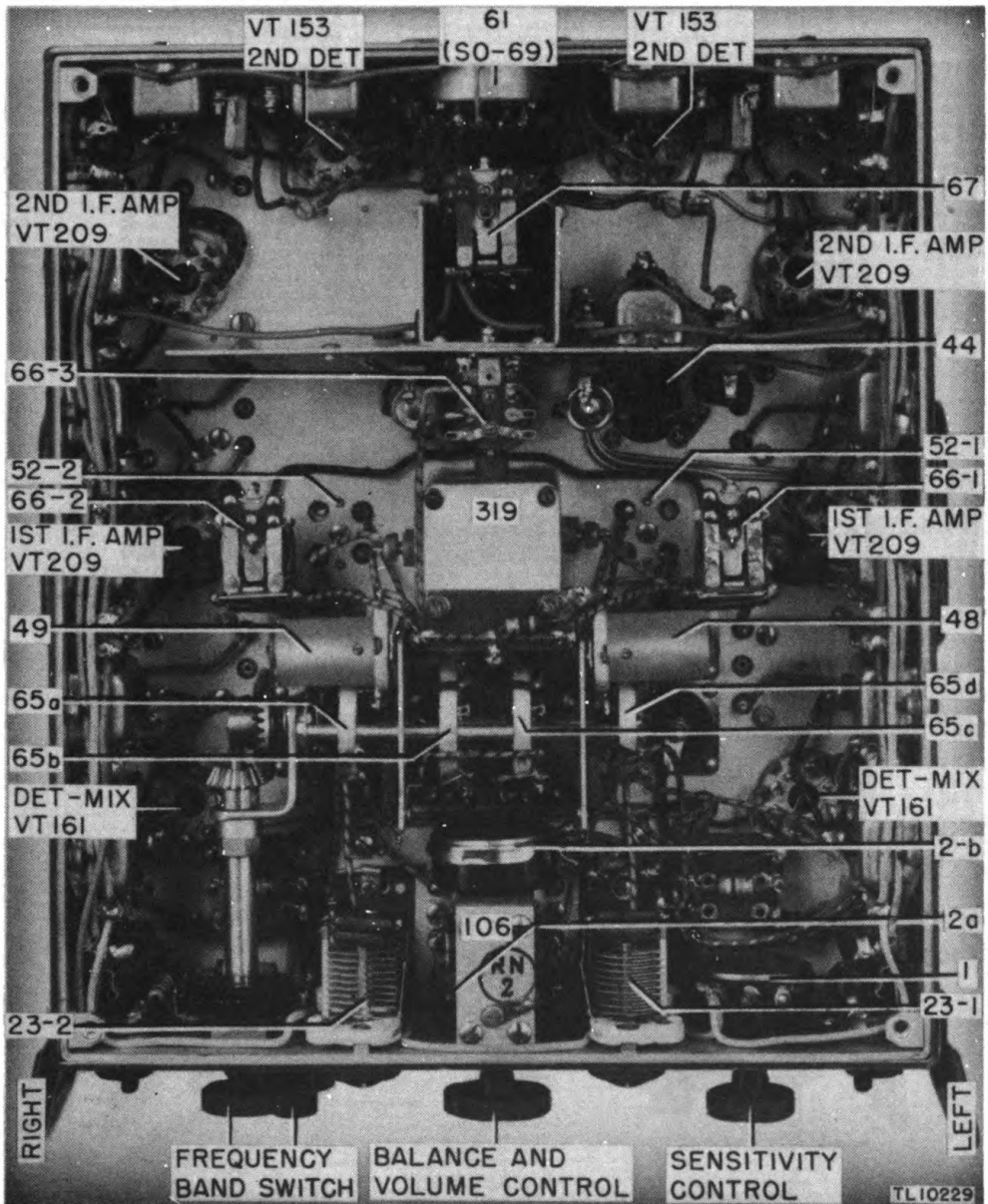


Figure 29. Radio Receiver BC-973-A, bottom view.

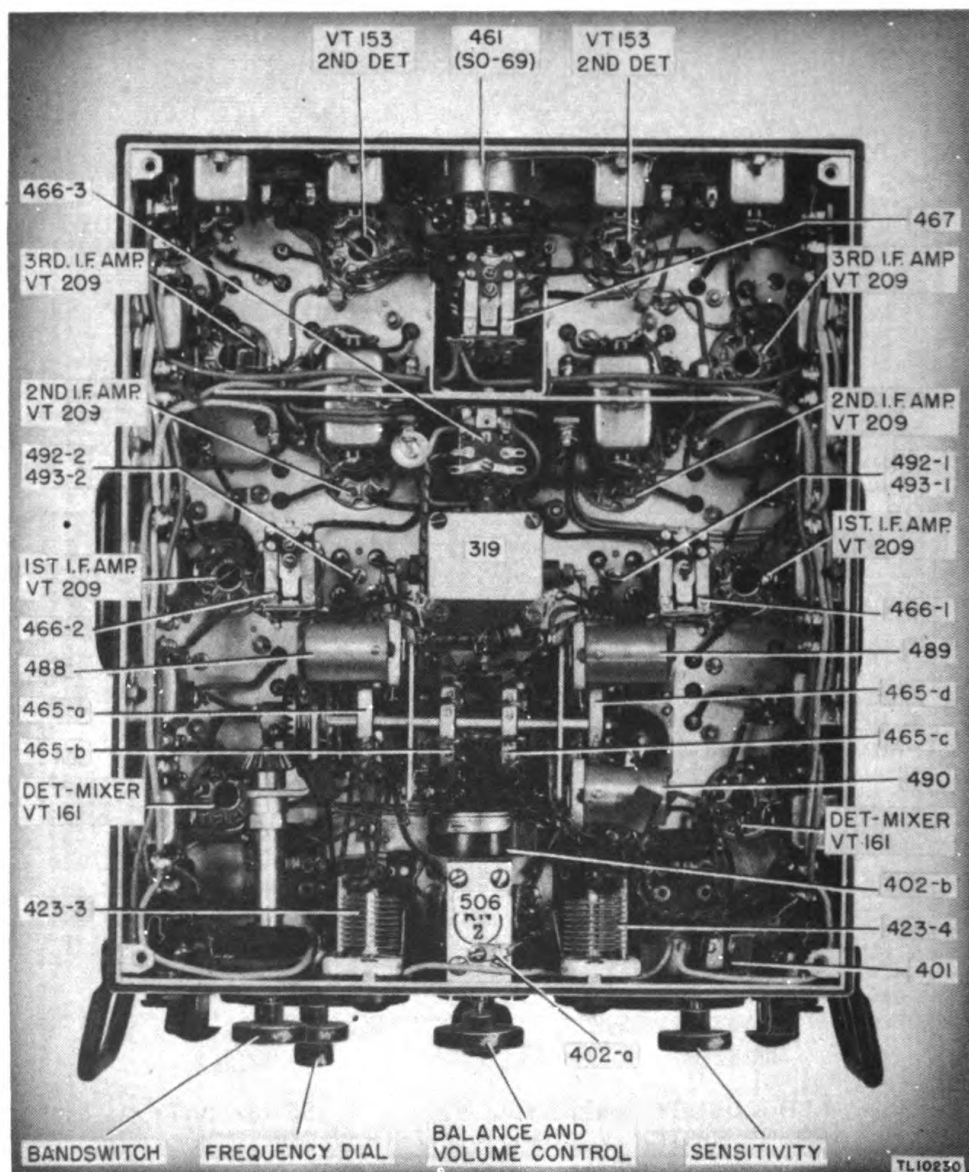
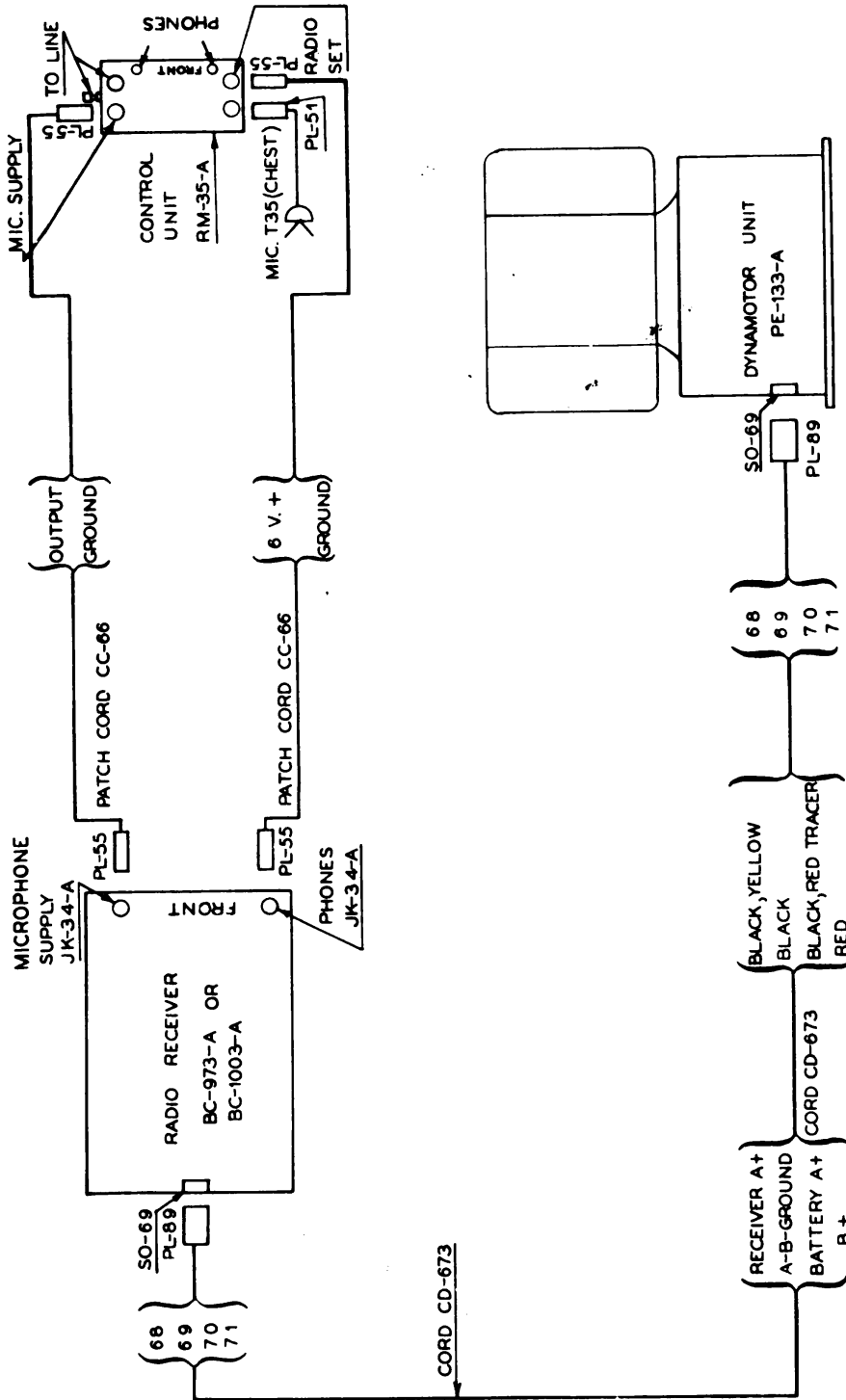


Figure 30. Radio Receiver BC-1003-A, bottom view.



TL10231

Figure 31. Radio Set SCR-503-A, cording diagram.

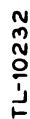
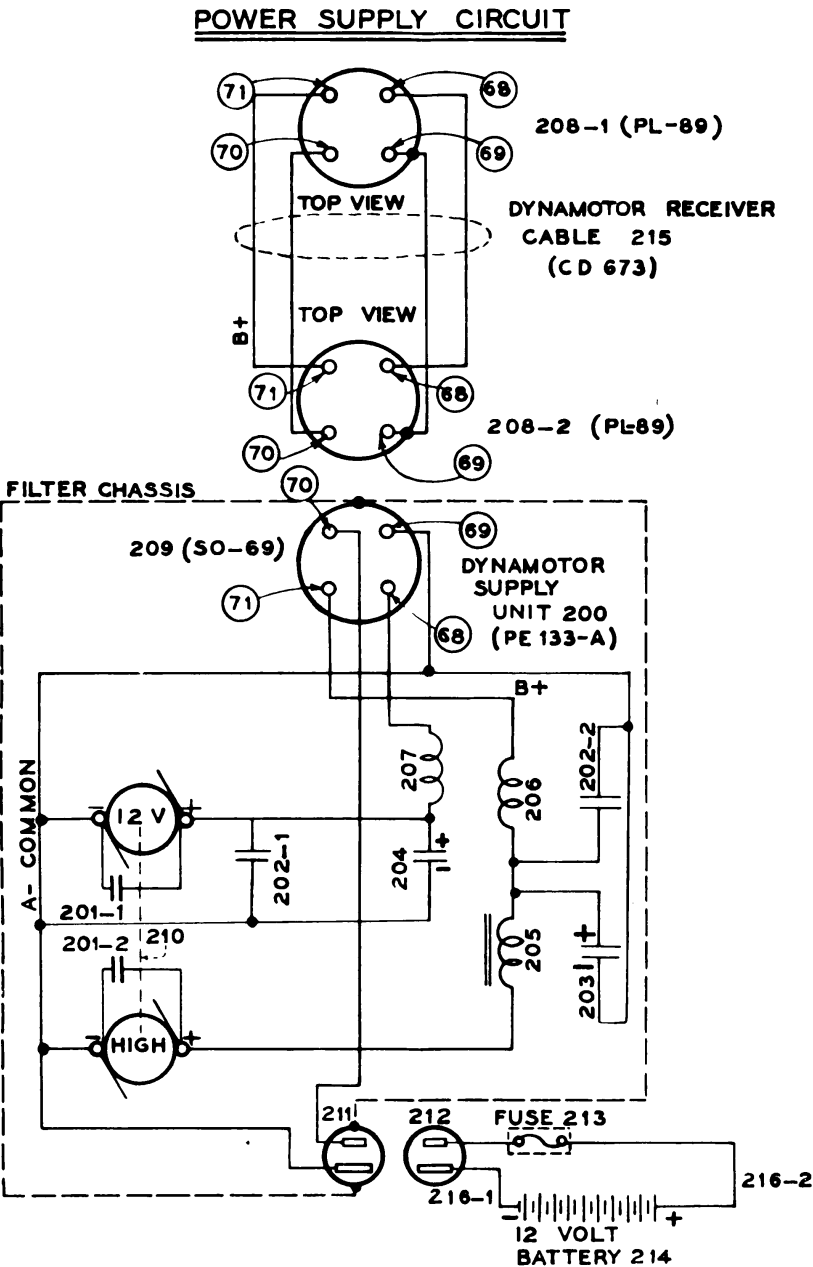


Figure 32. Control Unit RM-35-A, schematic diagram.



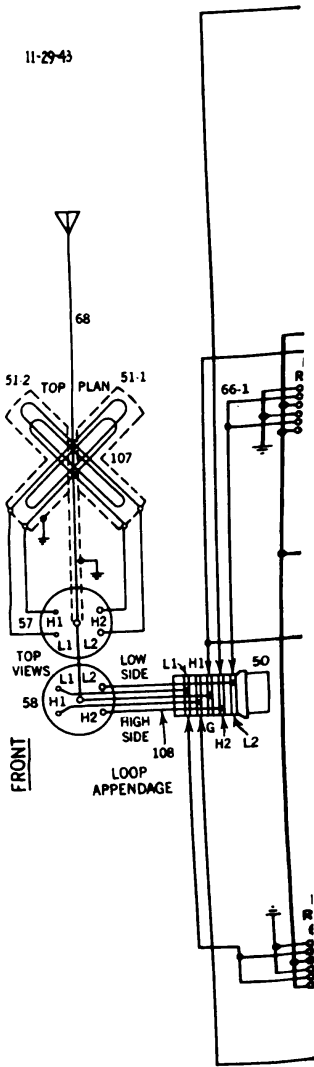
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Figure 33. Power supply circuit, schematic diagram.

LEGEND (BC-973-A) (Contd)

Reference No.	Name of Part	Value	Tolerance
9	Resistor, Fixed	2,000 ohm	$\frac{1}{2}$ W $\pm$ 5%
10	Resistor, Fixed	5,000 ohm	$\frac{1}{2}$ W $\pm$ 5%
11	Resistor, Fixed	20,000 ohm	$\frac{1}{2}$ W $\pm$ 5%
12	Resistor, Fixed	35,000 ohm	$\frac{1}{2}$ W $\pm$ 5%
13	Resistor, Fixed	50,000 ohm	$\frac{1}{2}$ W $\pm$ 5%
14	Resistor, Fixed	75,000 ohm	$\frac{1}{2}$ W $\pm$ 5%
15	Resistor, Fixed	100,000 ohm	$\frac{1}{2}$ W $\pm$ 5%
16	Resistor, Fixed	150,000 ohm	$\frac{1}{2}$ W $\pm$ 5%
17	Resistor, Fixed	500,000 ohm	$\frac{1}{2}$ W $\pm$ 5%
18	Resistor, Fixed	1 megohm	$\frac{1}{2}$ W $\pm$ 5%
19a	Capacitor, Variable	600 μ f	
19b	Capacitor, Variable	120 μ f	
19c	Capacitor, Variable	400 μ f	
19d	Capacitor, Variable	600 μ f	
20	Capacitor, Variable (Dual)	15 μ f	
21	Capacitor, Variable (Single)	15 μ f	
22	Capacitor, Variable (Single)	15 μ f	
23	Capacitor, Variable	35 μ f	
24	Capacitor, Variable	100 μ f	
25	Capacitor, Fixed Mica	40 μ f	
26	Capacitor, Fixed Mica	50 μ f	$\pm$ 2%
27	Capacitor, Fixed Mica	75 μ f	$\pm$ 2%
28	Capacitor, Fixed Mica	100 μ f	$\pm$ 2%
29	Capacitor, Fixed Mica	90 μ f	$\pm$ 2%
30	Capacitor, Fixed Mica	150 μ f	$\pm$ 2%
31	Capacitor, Fixed Mica	190 μ f	$\pm$ 2%
32	Capacitor, Fixed Mica	250 μ f	$\pm$ 2%
33	Capacitor, Fixed Mica	280 μ f	$\pm$ 2%
34	Capacitor, Fixed Mica	800 μ f	$\pm$ 2%
35	Capacitor, Fixed Mica	2,640 μ f	$\pm$ 2%
	(Approx. see Instr. Book)		
36	Capacitor, Fixed Mica	0.002 μ fd	$\pm$ 10%
37	Capacitor, Fixed Mica	0.01 μ f	$\pm$ 10%
38	Capacitor, Fixed Paper (Single)	0.1 μ f	$\pm$ 20%
39	Capacitor, Fixed Paper (Dual)	0.1 μ f	$\pm$ 10%
40	Capacitor, Fixed Paper	0.5 μ f	$\pm$ 10%
41	Capacitor, Fixed Electrolytic	25 μ f	
42	Capacitor, Fixed Electrolytic	500 μ f	
43	Meter, Dual Movement		
44	Audio Output Transformer		
45	1st IF Transformer		
46	2d IF Transformer		
47	Diode Transformer		
48	B Band Sense Transformer		
49	A Band Sense Transformer		
50	Collector Rings		
51	Loop (4 Turn)		
52	Loop Loading Coil		

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LEGEND (BC-973-A) (Contd)

Reference No.	Name of Part	Value	Tolerance
53	HF Oscillator Coil, A Band		
54	HF Oscillator Coil, B Band		
55	Beat Frequency Oscillator Coil		
56	Jack, JK-34-A		
57	5-Prong Female Loop Plug		
58	5-Prong Female Loop Receptacle		
59	5-Prong Male Meter Plug		
60	4-Prong Female Meter Receptacle		
61	4-Prong Male Cable Receptacle		
62	SPST Toggle Switch		
63	SPST Push Button Switch		
64	DPST Toggle Switch		
65a	4—Gang TPDT Switch		
65b	4—Gang TPDT Switch		
65c	4—Gang TPDT Switch		
65d	4—Gang TPDT Switch		
66	4 Volt Relay DPDT		
67	12 Volt Relay DPDT		
68	Antenna AN-45-E (Sense)		
69	Pilot Bulb, 12V, Screw Base		
72	Resistor, Fixed	10,000 ohm	$\frac{1}{2} W \pm 5\%$
75	Resistor, Fixed	50,000 ohm.	$1 W \pm 5\%$
76	Capacitor, Fixed Mica	5 μf	$\pm 2\%$
101	1st IF Transformer Assembly		
102	2d IF Transformer Assembly		
103	Diode Transformer Assembly		
104	HF Oscillator Assembly		
105	B-F-O-Oscillator Assembly		
107	Loop Assembly		
108	Loop Appendage		
120	Resistor, Fixed	100 ohm	$\frac{1}{2} W \pm 5\%$
401	Potentiometer	1,500 ohm	
402a	Potentiometer	20,000 ohm	
402b	Potentiometer	60,000 ohm	
403	SPST Switch in Dual Control		
405	Resistor, Fixed	50 ohm	$\frac{1}{2} W \pm 5\%$
406	Resistor, Fixed	300 ohm	$\frac{1}{2} W \pm 5\%$
407	Resistor, Fixed	500 ohm	$\frac{1}{2} W \pm 5\%$
408	Resistor, Fixed	1,000 ohm	$1 W \pm 5\%$
409	Resistor, Fixed	2,000 ohm	$\frac{1}{2} W \pm 5\%$
410	Resistor, Fixed	5,000 ohm	$\frac{1}{2} W \pm 5\%$
411	Resistor, Fixed	20,000 ohm	$1 W \pm 5\%$
412	Resistor, Fixed	35,000 ohm	$\frac{1}{2} W \pm 5\%$
413	Resistor, Fixed	50,000 ohm	$\frac{1}{2} W \pm 5\%$
414	Resistor, Fixed	75,000 ohm	$\frac{1}{2} W \pm 5\%$
415	Resistor, Fixed	100,000 ohm	$\frac{1}{2} W \pm 5\%$
416	Resistor, Fixed	150,000 ohm	$\frac{1}{2} W \pm 5\%$
417	Resistor, Fixed	500,000 ohm	$\frac{1}{2} W \pm 5\%$

LEGEND (BC-973-A) (Contd)

<i>Reference No.</i>	<i>Name of Part</i>	<i>Value</i>	<i>Tolerance</i>
418	Resistor, Fixed	1 megohm	$\frac{1}{2} W \pm 5\%$
419a	Capacitor, Variable Tuning	600 μf	
419b	Capacitor, Variable Tuning	120 μf	
419c	Capacitor, Variable Tuning	400 μf	
419d	Capacitor, Variable Tuning	600 μf	
420	Capacitor, Variable (Dual)	15 μf	
421	Capacitor, Variable (Single)	15 μf	
422	Capacitor, Variable (Single)	15 μf	
423	Capacitor, Variable	35 μf	
425	Capacitor, Fixed Mica	40 μf	$\pm 2\%$
426	Capacitor, Fixed Mica	50 μf	$\pm 2\%$
427	Capacitor, Fixed Mica	75 μf	$\pm 2\%$
428	Capacitor, Fixed Mica	100 μf	$\pm 10\%$
429	Capacitor, Fixed Mica	100 μf	$\pm 2\%$
432	Capacitor, Fixed Mica	250 μf	$\pm 2\%$
435	Capacitor, Fixed Mica	0.001 μf	$\pm 10\%$
436	Capacitor, Fixed Mica	0.002 μf	$\pm 10\%$
437	Capacitor, Fixed Mica	0.01 μf	$\pm 10\%$
438	Capacitor, Fixed Paper (Single)	0.1 μf	$\pm 10\%$
439	Capacitor, Fixed Paper (Dual)	0.1 μf	$\pm 10\%$
440	Capacitor, Fixed Paper	0.5 μf	$\pm 10\%$
441	Capacitor, Fixed Electrolytic	25 μf	
442	Capacitor, Fixed Electrolytic	500 μf	
443	Meter, Dual Movement		
450	Collector Rings		
456	Jack, JK-34-A		
457	5-Prong Female Loop Plug		
458	5-Prong Male Loop Receptacle		
459	5-Prong Male Meter Plug		
460	4-Prong Female Meter Receptacle		
461	4-Prong Male Cable Receptacle		
462	SPST Toggle Switch		
463	SPST Push Button Switch		
464	DPST Toggle Switch		
465a	4-Gang TPTT Switch		
465b	4-Gang TPTT Switch		
465c	4-Gang TPTT Switch		
465d	4-Gang TPTT Switch		
466	4 Volt Relay DPDT		
467	12 Volt Relay DPDT		
468	Antenna AN-45-E (Sense)		
469	Pilot Bulb, 12 Volt, Screw Base		
473	Resistor, Fixed (Approx. see inst. book)	35 ohm	1W $\pm 5\%$
474	Resistor, Fixed	10,000 ohm	$\frac{1}{2} W \pm 5\%$
475	Resistor, Fixed	10,000 ohm	5W $\pm 10\%$
478	Capacitor, Fixed Mica	15 μf	$\pm 2\%$
479	Capacitor, Fixed Mica	35 μf	$\pm 2\%$

LEGEND (BC-973-A) (Contd)

<i>Reference No.</i>	<i>Name of Part</i>	<i>Value</i>	<i>Tolerance</i>
480	Capacitor, Fixed Mica	55 $\mu\mu\text{f}$	$\pm 2\%$
481	Capacitor, Fixed Mica	70 $\mu\mu\text{f}$	$\pm 2\%$
482	Capacitor, Fixed Mica	125 $\mu\mu\text{f}$	$\pm 2\%$
483	Capacitor, Fixed Mica	155 $\mu\mu\text{f}$	$\pm 2\%$
484	1st IF Transformer		
485	2nd IF Transformer		
486	3rd IF Transformer		
487	Diode Transformer		
488	Sense Transformer A Band		
489	Sense Transformer B Band		
490	Sense Transformer C Band		
491	Loop (55 Turn)		
492	Loop Loading Coil C Band		
493	Loop Loading Coil A Band		
494	HF Oscillator Coil A Band		
495	HF Oscillator Coil B Band		
496	HF Oscillator Coil C Band		
497	Beat Frequency Oscillator Coil		
498	Capacitor, Fixed Mica	25 $\mu\mu\text{f}$	$\pm 2\%$
499	Capacitor, Fixed Mica	120 $\mu\mu\text{f}$	$\pm 2\%$
501	1st IF Transformer Assembly		
502	2nd IF Transformer Assembly		
503	3rd IF Transformer Assembly		
504	Diode Transformer Assembly		
505	B-f-o Oscillator Assembly		
507	HF Oscillator Assembly		
508	Loop Appendage		
509	Loop Assembly		
511	Resistor, Fixed	50,000 ohm	1W $\pm 5\%$
520	Resistor, Fixed	100 ohm	1W $\pm 5\%$
600	Capacitor, Fixed Mica	300 $\mu\mu\text{f}$	$\pm 2\%$

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491-2
 LOOP

 509
 457
 TOP
 VIEW:
 L1
 458
 H
 FRONT

